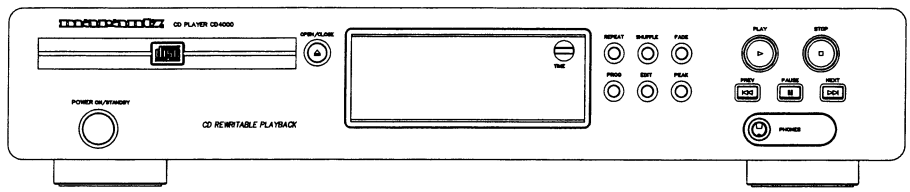
# Service Manual

## CD4000/N1B, /K1B /N2B, /K2B

## CD Player

CD4000



COMPACT disc DIGITAL AUDIO

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Please use this service manual with referring to the user guide (D.F.U) without fail.

marantz®

# - CD4000 -


272W85ƃ10 AO
3120 78ƃ 00040
First Issue: 1999.06

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**KOREA**

**MK ENTERPRISES LTD.**
ROOM 604/605, ELECTRO-OFFICETEL, 16-58,
3GA, HANGANG-RO, YONGSAN-KU, SEOUL
KOREA
PHONE : +822 - 3232 - 155
FAX : +822 - 3232 - 154

### SHOCK, FIRE HAZARD SERVICE TEST :

**CAUTION :** After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins ( with unit NOT connected to AC mains and its Power switch ON ), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard No. 1492.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

990521A.O

# TECHNICAL SPECIFICATION

## General

| | |
|---|---|
| Dimensions (WxHxD) | : 435 x 86 x 265mm |
| Weight | : 2,9kg |

## Accessories

| | |
|---|---|
| Instruction for use | : 3139 116 18890 for /N<br>: 3139 116 19100 for /K |
| Remote control | : 3139 228 82590 |

## Mains voltage

| | |
|---|---|
| /N | : 220-230V(±10%) 50Hz |
| /K | :110-120V/220-230V(±10%) 50/60Hz |

## Power consumption

| | |
|---|---|
| stand by | : ≤5W |
| operating | : approx. 8W |

## Audio performance

| | |
|---|---|
| Number of channels | : 2 |
| Output voltage (Line out) | : 2VRMS ±3dB |
| Unbalance left-right | : ≤1dB |
| Frequency response | : 20Hz-20kHz ≤0,4dB |
| Signal to noise ratio | : 98 dB typ. |
| Dynamic range | : 95dB typ. at 1kHz |
| THD | : ≤0,0063% at 1kHz |
| Channel separation | : 85dB typ. at 1kHz |

## Headphone output

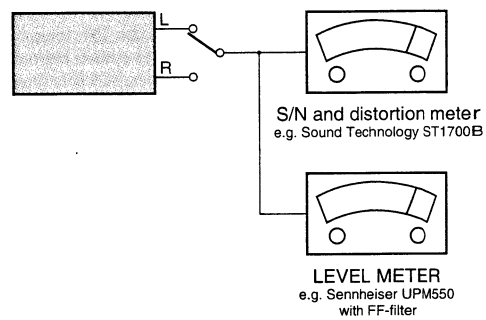
| | |
|---|---|
| Output level (1kHz, 0dB) | : ≥5VRMS |
| Unbalance left-right | : ≤1,2dB |
| Output impedance | : 120Ω |
| Load impedance | : 32Ω - 600Ω |
| Output power | : 25mW at 32Ω<br>: 52mW at 120Ω<br>: 29mW at 600Ω |

## Laser

| | |
|---|---|
| Output power | : <5mW (3mW typ.) |
| Wavelength | : 780nm |

## Measurement setup

Use Audio Signal disc SBC429 4822 397 30184




## RC 5 Commands

**System code = 20**

| Command | Code | Command | Code | Command | Code |
|---|---|---|---|---|---|
| KEY "0" | 0 | KEY "9" | 9 | SHUFFLE | 28 |
| KEY "1" | 1 | PLAY | 53 | SCAN | 43 |
| KEY "2" | 2 | STOP | 54 | REPEAT | 29 |
| KEY "3" | 3 | PAUSE | 48 | FADE | 120 |
| KEY "4" | 4 | TIME | 11 | VOLUME UP | 16 |
| KEY "5" | 5 | PREVIOUS | 33 | VOLUME DOWN | 17 |
| KEY "6" | 6 | REVIEW | 50 | STAND BY | 12 |
| KEY "7" | 7 | CUE | 52 | MUTE | 13 |
| KEY "8" | 8 | PROGRAM | 36 | NEXT | 32 |

## ESD

### (GB) WARNING
All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wristband with resistance. Keep components and tools at this potential.

### (F) ATTENTION
Tous les IC et beaucoup d´autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévite pourrait être considérablement écourtée par le fait qu´aucune précaution nést prise à leur manipulation.
Lors de réparations, s´assurer de bien être relié au même potentiel que la masse de l´appareil et enfileer le bracelet serti d´une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l´on utilise soient également à ce potentiel.

### (D) WARNUNG
Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.
Sorgen Sie dafür, daß sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

### (NL) WAARSCHUWING
Alle IC´s en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen vermindern. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

### (I) AVVERTIMENTO
Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparationi occorre quindi essere collegato allo stesso potenziale che quello della massa delápparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

### (GB) AVAILABLE ESD PROTECTION EQUIPMENT :

| | | |
|---|---|---|
| **anti-static table mat** | large 1200x650x1.25mm | 4822 466 10953 |
| | small 600x650x1.25mm | 4822 466 10958 |
| **anti-static wristband** | | 4822 395 10223 |
| **connection box** (3 press stud connections, 1M ) | | 4822 320 11307 |
| **extendible cable** (2m, 2M , to connect wristband to connection box) | | 4822 320 11305 |
| **connecting cable** (3m, 2M , to connect table mat to connection box) | | 4822 320 11306 |
| **earth cable** (1M , to connect any product to mat or to connection box) | | 4822 320 11308 |
| **KIT ESD3** (combining all 6 prior products - small table mat) | | 4822 310 10671 |
| **wristband tester** | | 4822 344 13999 |

**AVAILABLE JIG for FR980**

| | |
|---|---|
| Extension PCB and wire kit | 4822 395 10815 |

## SAFETY

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.
Safety components are marked by the symbol ⚠

(F)
Les normes de sécurité exigent que l`appareil soit remis à l`état d`origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.
Les composants de sécurité sont marqués ⚠

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden.
Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkeliijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.
De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(I)
Le norme di sicurezza estigono che l´apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiago identici a quelli specificati.
Componenty di sicurezza sono marcati con ⚠

(GB) **DANGER**: Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

**CLASS 1**
**LASER PRODUCT**

### (S) Varning !
Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

### (DK) Advarsel !
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

### (SF) Varoitus !
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen !

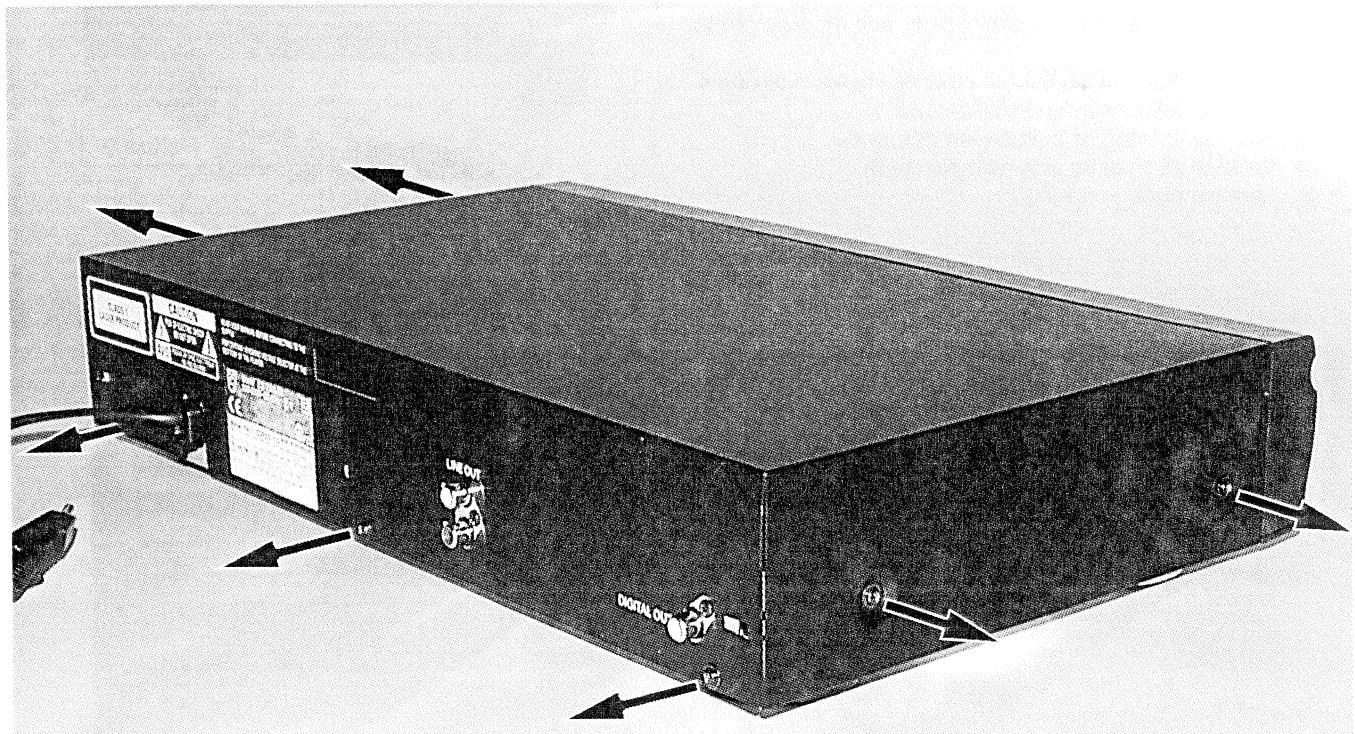
(GB)
After servicing and before returning the set to customer perform a leakage current measurement test from all exposed metal parts to earth ground, to assure no shock hazard exists.
The leakage current must not exceed 0.5mA.

(F)
"Pour votre sécurite, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

# MECHANICAL INSTRUCTIONS

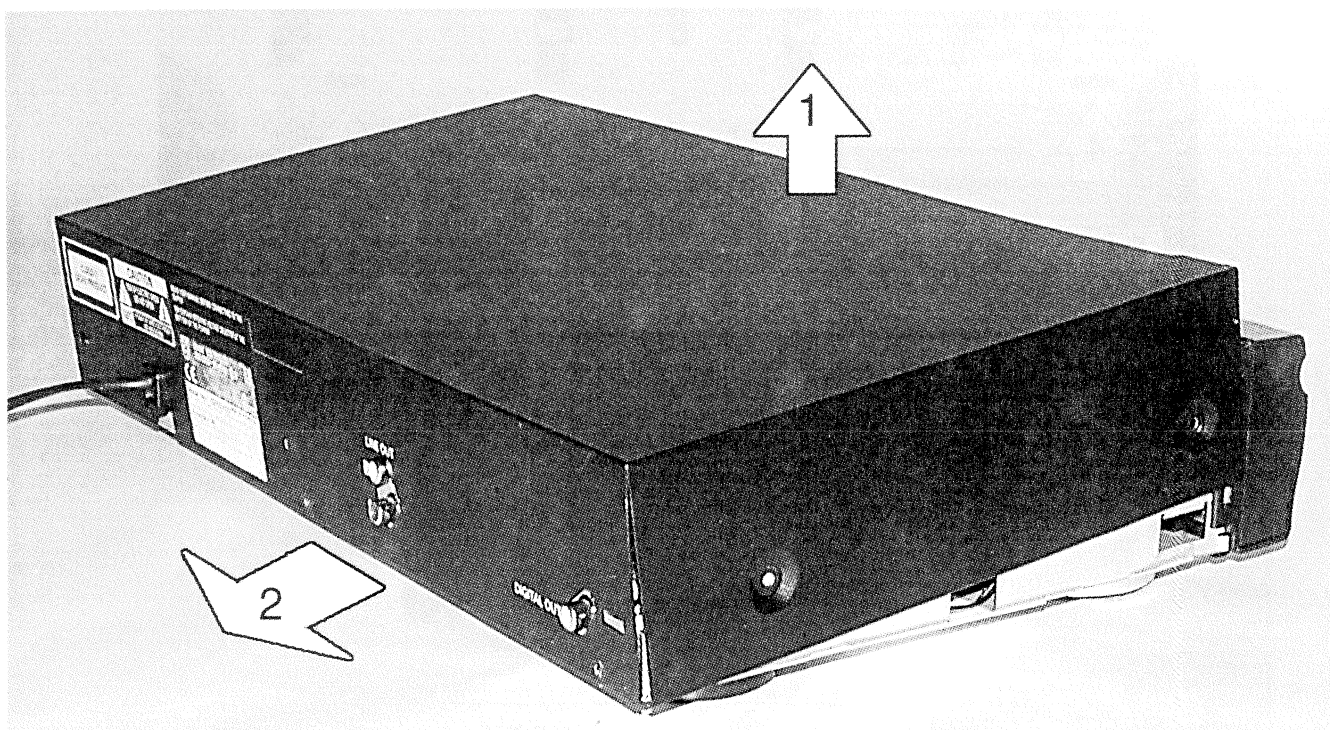
## Dismantling Top Cover

1) Loosen 7x screw as shown in picture 1.



picture 1

2) Lift top cover as shown in picture 2.
3) Remove top cover.

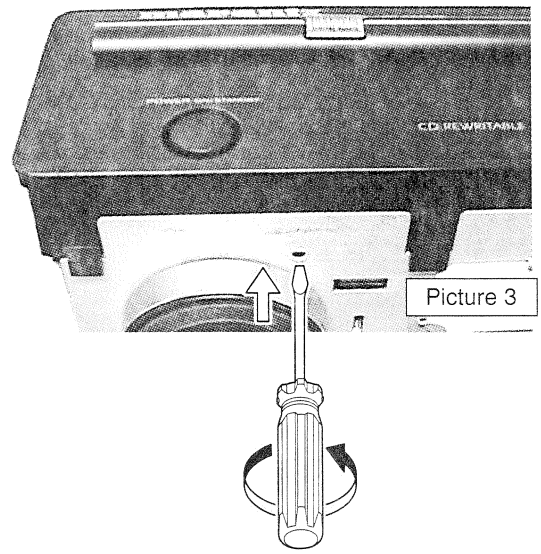



picture 2

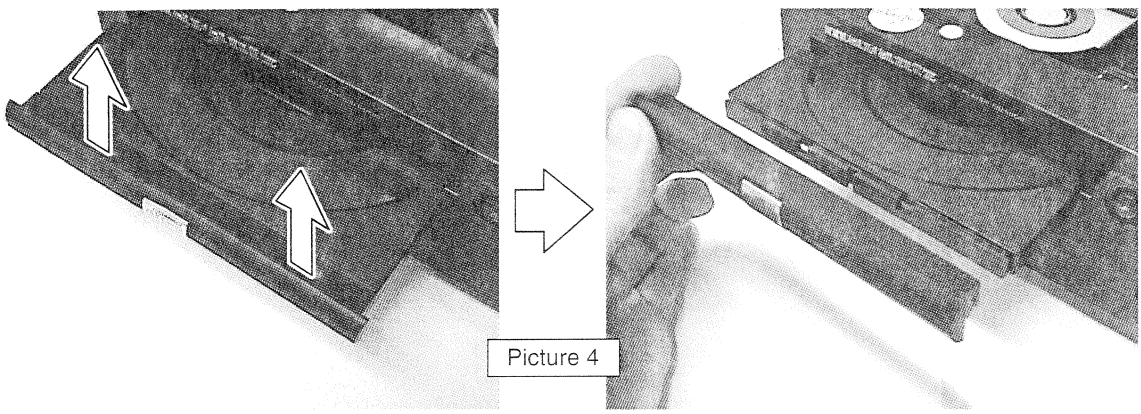
## MECHANICAL INSTRUCTION

### Dismantling Front

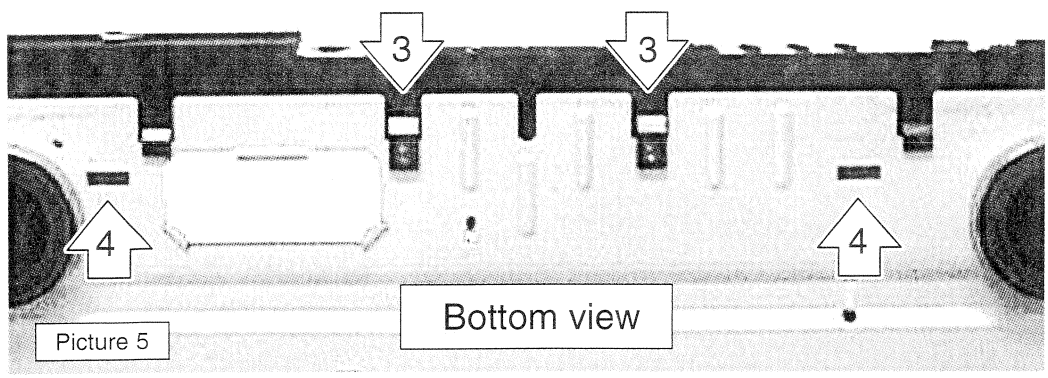
1) Press open/close button to open the tray. If the tray doesnít work, turn counterclockwise a small screwdriver into the hole as shown in picture 3. Then the tray comes out. After the first centimeter it is possible to pull the tray out by hand.
2) Release the door cover of the tray as shown in picture 4.
3) Loosen 2x screw as shown in picture 5.
4) Release 2x snap on button (see picture 5).
5) Release 2x snap on side (see picture 6).
6) Remove front.



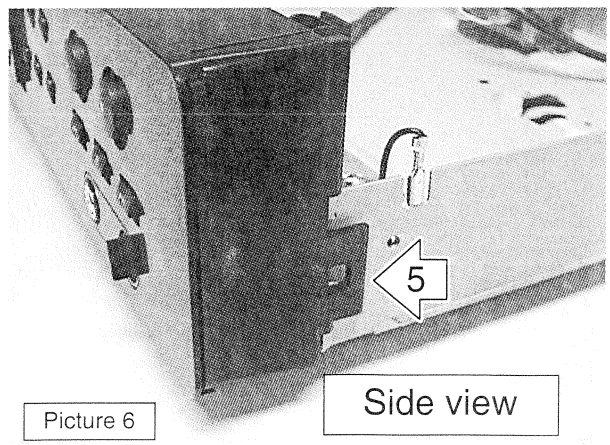

Picture 3



Picture 4




Picture 5




Picture 6

# Dismantling hints CD Short Loader

## Dismantling the tray

a) Press open/close button to open the tray. If the tray doesn´t work, use a small screwdriver as shown in Fig.1 point 1 to move the tray outside. After the first centimetre it is possible to pull the tray out by hand.

b) Release two snaps and remove tray.

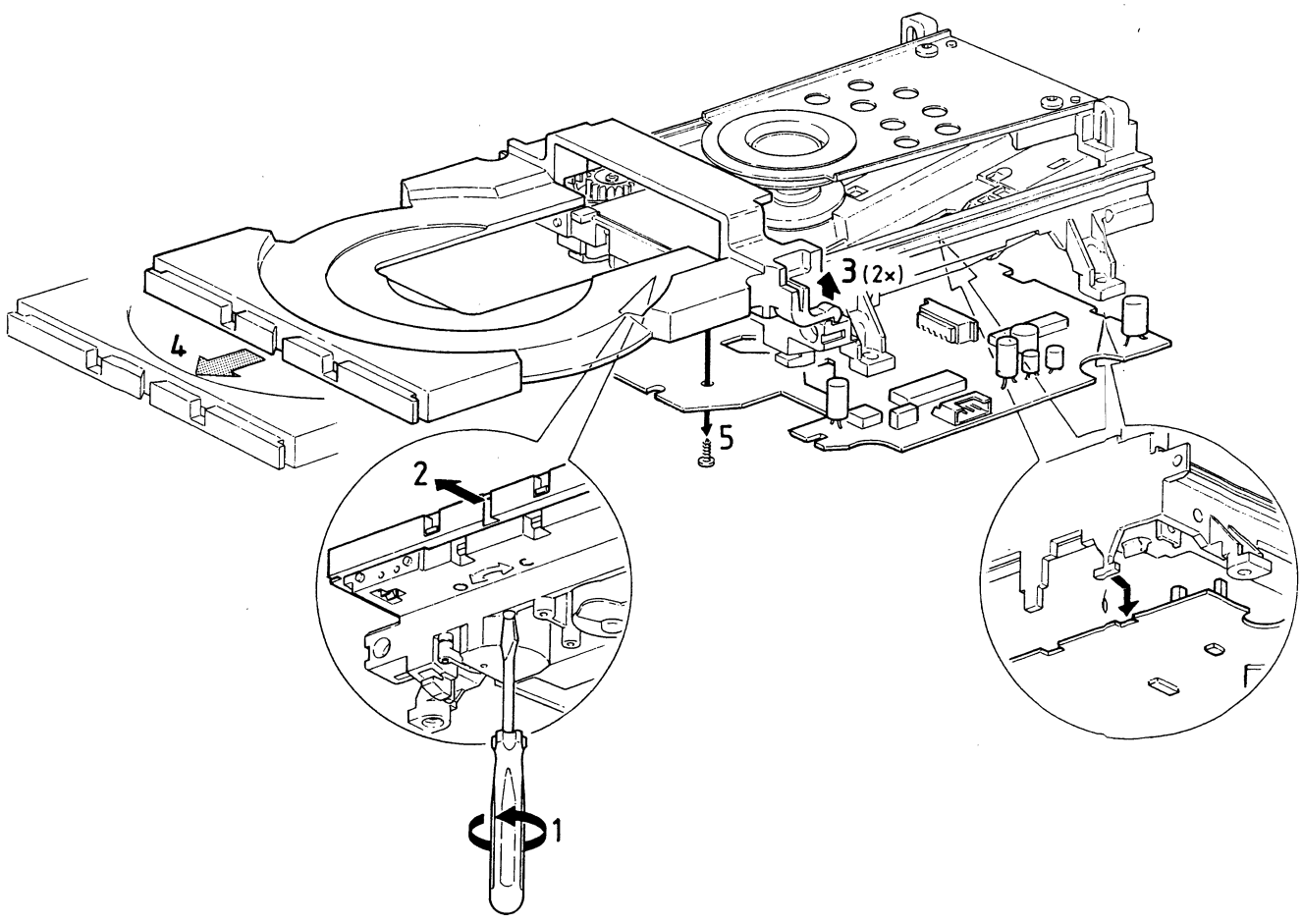



Fig. 1

## *Assembly of gear*

a) Use a pin (e.g. a paperclip) to align the cam wheel (a) withthe gear wheel (b). See Fig. 2.

b) Fix the wheels with the small plastic whashers.

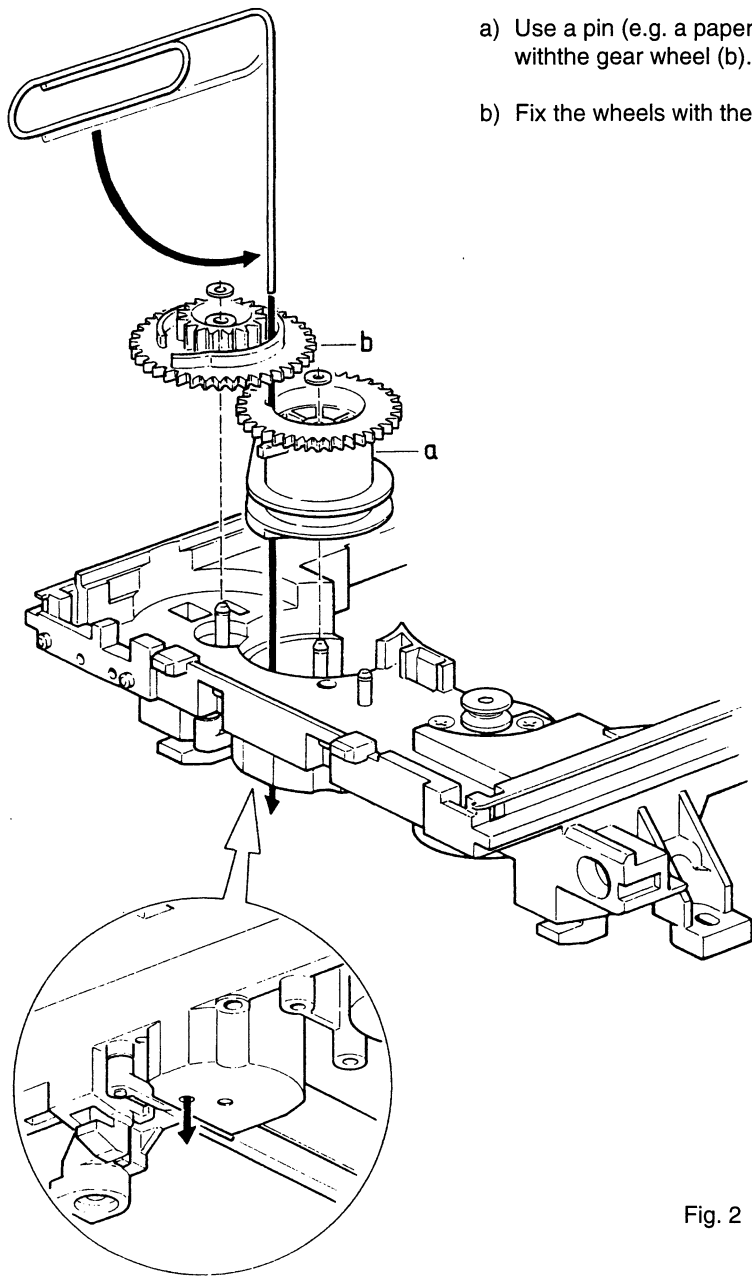



Fig. 2

c) Mount idle wheel 2 (c) and idle wheel 1 (d) in any position. See Fig. 3.

d) Fix the idle wheel 1 (d) with the small plastic whasher.

e) Mount the driving belt.

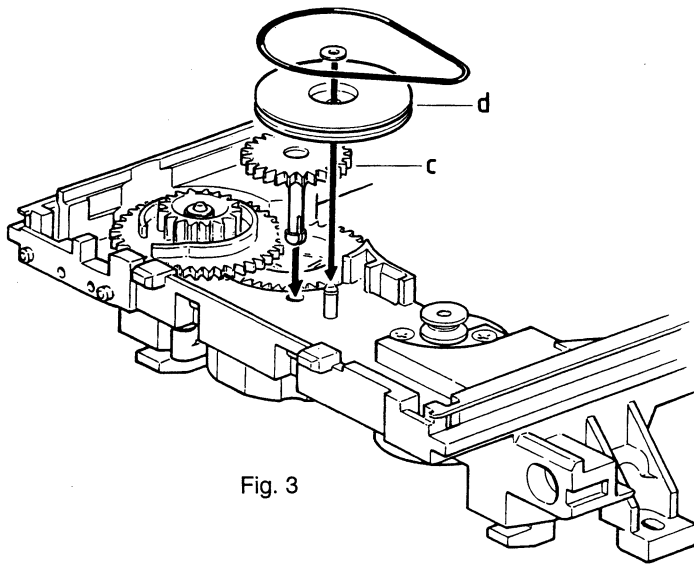



Fig. 3

f) Mount the pinion guiding assy and the cover as shown in Fig. 4.

g) Turn the gear wheel (b) counter clockwise to endposition.

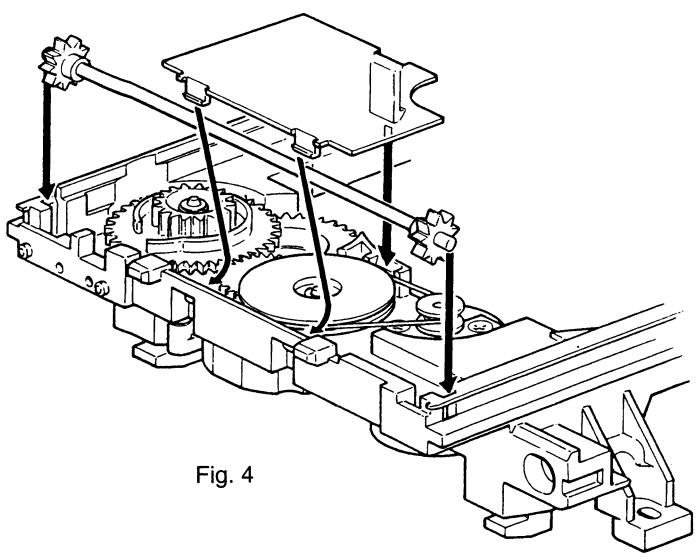


Fig. 4

h) Mount the CD Mechanism as shown in Fig. 5.

i) Mount the tray (Align the tray to the chassis and push it inside).

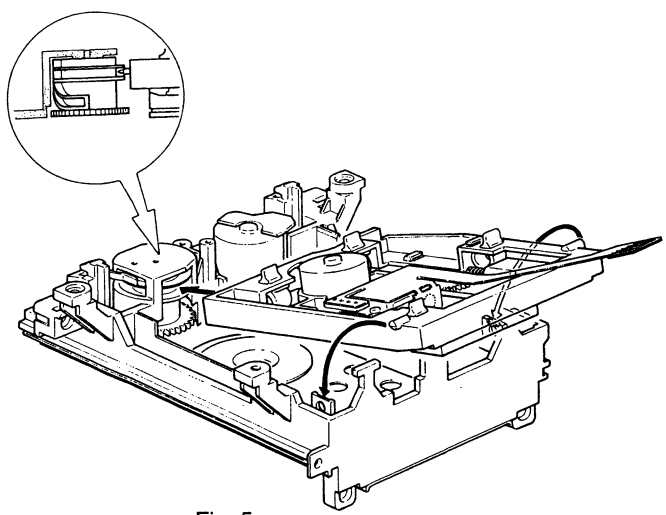


Fig. 5

## *Check if tray mechanism works correctly!*

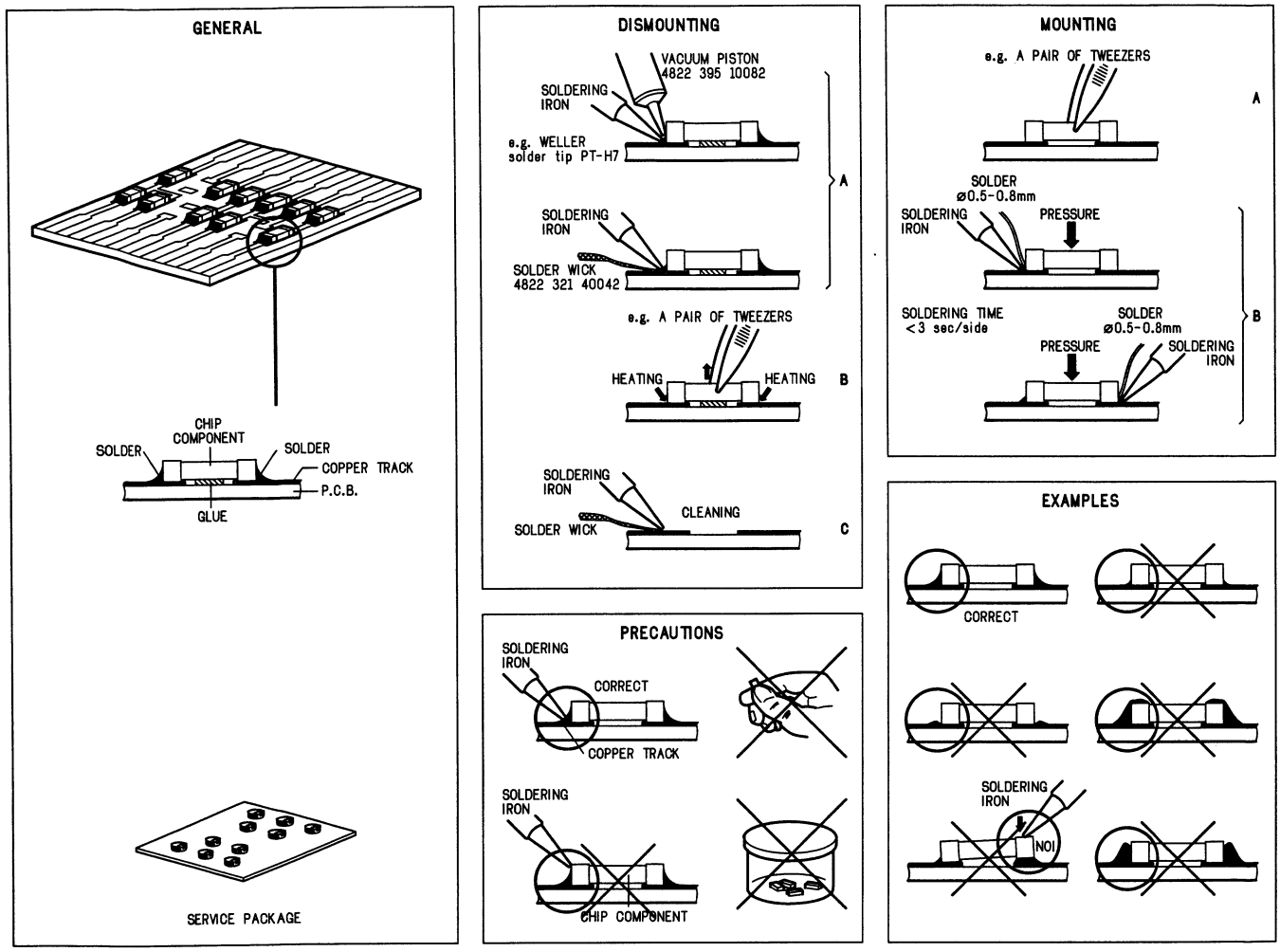
1) Turn the gear wheel (b) clockwise to its endposition (Use a small screwdriver as shown in Fig. 1 point 1).

   The tray has to move to inner position first and then the CD mechanism has to move to its upper position.

2) Turn the gear wheel (b) counter clockwise to its endposition.

   The CD Mechanism has to move to its lower position first and then the tray has to move outside.

# HANDLING CHIP COMPONENTS



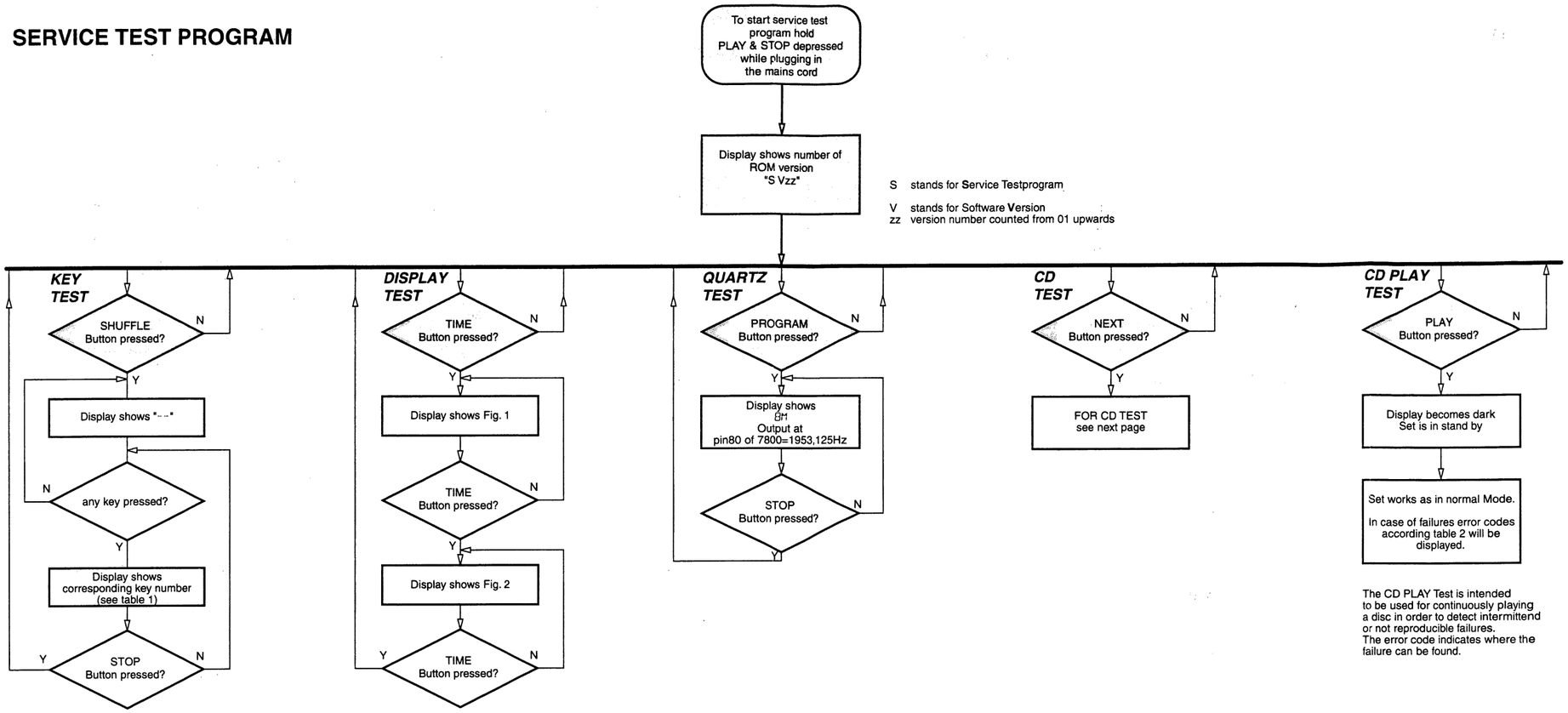

## SERVICE TOOLS

**TORX T10** screwdriver with shaftlength 150mm .....4822 395 50423
**TORX screwdriver set** SBC 163 .....4822 295 50145

**Audio signal disc** SBC 429.....4822 397 30184
**Playability test disc** SBC444 .....4822 397 30245
**Test disc 5** (disc without errors) +
**Test disc 5A** (disc with dropout errors, black spots and fingerprints)
SBC 426/426A .....4822 397 30096
**Burn in test disc** (65 min. 1kHz signal at -30dB level without "pause") ...4822 397 30155

5-2

# SERVICE TEST PROGRAM


To start service test program hold PLAY & STOP depressed while plugging in the mains cord
Display shows number of ROM version "S Vzz"
S stands for Service Testprogram
V stands for Software Version
zz version number counted from 01 upwards
KEY TEST
SHUFFLE Button pressed?
Display shows "- - -"
any key pressed?
Display shows corresponding key number (see table 1)
STOP Button pressed?
DISPLAY TEST
TIME Button pressed?
Display shows Fig. 1
TIME Button pressed?
Display shows Fig. 2
TIME Button pressed?
QUARTZ TEST
PROGRAM Button pressed?
Display shows &H
Output at pin80 of 7800=1953,125Hz
STOP Button pressed?
CD TEST
NEXT Button pressed?
FOR CD TEST see next page
CD PLAY TEST
PLAY Button pressed?
Display becomes dark Set is in stand by
Set works as in normal Mode.
In case of failures error codes according table 2 will be displayed.
The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittend or not reproducible failures. The error code indicates where the failure can be found.

### *KEY TEST*

| Key | Number | Key | Number | Key | Number |
|---|---|---|---|---|---|
| Next | 1 | Shuffle | 7 | Fade | 13 |
| Previous | 2 | Scan | 8 | Time | 14 |
| Play | 3 | Program | 9 | CD-Text | 15 |
| Stop | EXIT | Peak search | 10 | Scroll | 16 |
| Open/Close | 5 | Repeat | 11 | Stand by | 17 |
| Edit | 6 | Pause | 12 | any RC button | RC |

Table 1

### *DISPLAY TEST*

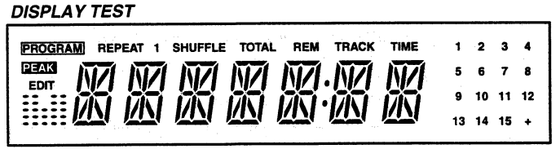



Fig. 1

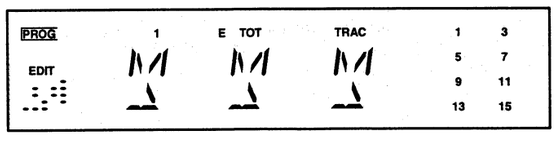



Fig. 2

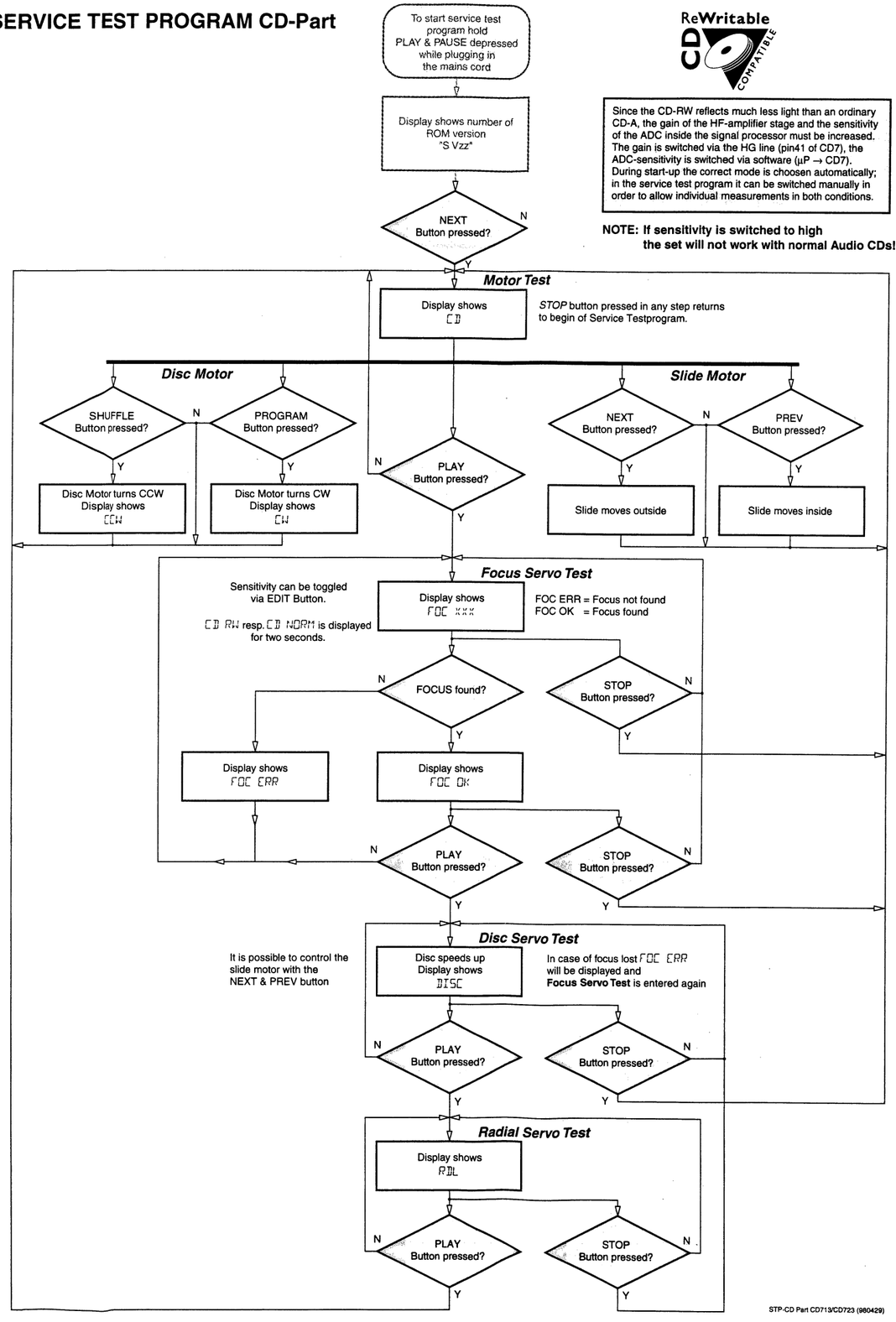
### *CD PLAY TEST*

| Error number | Type | Description |
|---|---|---|
| 1000 | W | **Focus error**<br>Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during playing the CD. |
| 1001 | W | **Radial error**<br>Triggered when the radial servo is not on track for a certain time during playing the CD. |
| 1002 | W | **Slide in error**<br>Generated when the slide did not reach its inner position (innerswitch is closed) before 6 seconds have passed by. Innerswitch or slide motor problem. |
| 1003 | W | **Slide out error**<br>Generated when the slide did not come out of its inner position (innerswitch is open) before 250ms have passed by. Innerswitch or slide motor problem. |
| 1005 | W | **Jump error**<br>Generated when the jump destination could not be found within a certain time. |
| 1006 | W | **Subcode error**<br>No valid subcode for a certain time. |
| 1007 | W | **PLL error**<br>The Phase -Lock-Loop could not lock within a certain time. |
| 1008 | W | **Turntable motor error**<br>Generated when the CD could not reach 75% of speed during starting up within a certain time. Disc motor problem |
| 1020 | F | **Focus search error**<br>Focus point has not been found within a certain time. |

Table 2

**W** = Warning
Error number remains on display till next warning/error
**F** = Fatal error
Set stops playing → Error number remains on display

## SERVICE TEST PROGRAM CD-Part


To start service test program hold PLAY & PAUSE depressed while plugging in the mains cord
Display shows number of ROM version "S Vzz"
NEXT Button pressed?
N
Y
Motor Test
Display shows CD
STOP button pressed in any step returns to begin of Service Testprogram.
Disc Motor
SHUFFLE Button pressed?
PROGRAM Button pressed?
Disc Motor turns CCW Display shows CCW
Disc Motor turns CW Display shows CW
PLAY Button pressed?
Slide Motor
NEXT Button pressed?
PREV Button pressed?
Slide moves outside
Slide moves inside
Focus Servo Test
Sensitivity can be toggled via EDIT Button.
CD RW resp. CD NORM is displayed for two seconds.
Display shows FOC xxx
FOC ERR = Focus not found
FOC OK = Focus found
FOCUS found?
STOP Button pressed?
Display shows FOC ERR
Display shows FOC OK
PLAY Button pressed?
STOP Button pressed?
Disc Servo Test
It is possible to control the slide motor with the NEXT & PREV button
Disc speeds up Display shows DISC
In case of focus lost FOC ERR will be displayed and Focus Servo Test is entered again
PLAY Button pressed?
STOP Button pressed?
Radial Servo Test
Display shows RDL
PLAY Button pressed?
STOP Button pressed?

STP-CD Part CD713/CD723 (980429)

ReWritable CD COMPATIBLE

Since the CD-RW reflects much less light than an ordinary CD-A, the gain of the HF-amplifier stage and the sensitivity of the ADC inside the signal processor must be increased. The gain is switched via the HG line (pin41 of CD7), the ADC-sensitivity is switched via software (µP → CD7). During start-up the correct mode is choosen automatically; in the service test program it can be switched manually in order to allow individual measurements in both conditions.

**NOTE: If sensitivity is switched to high the set will not work with normal Audio CDs!**



5-3

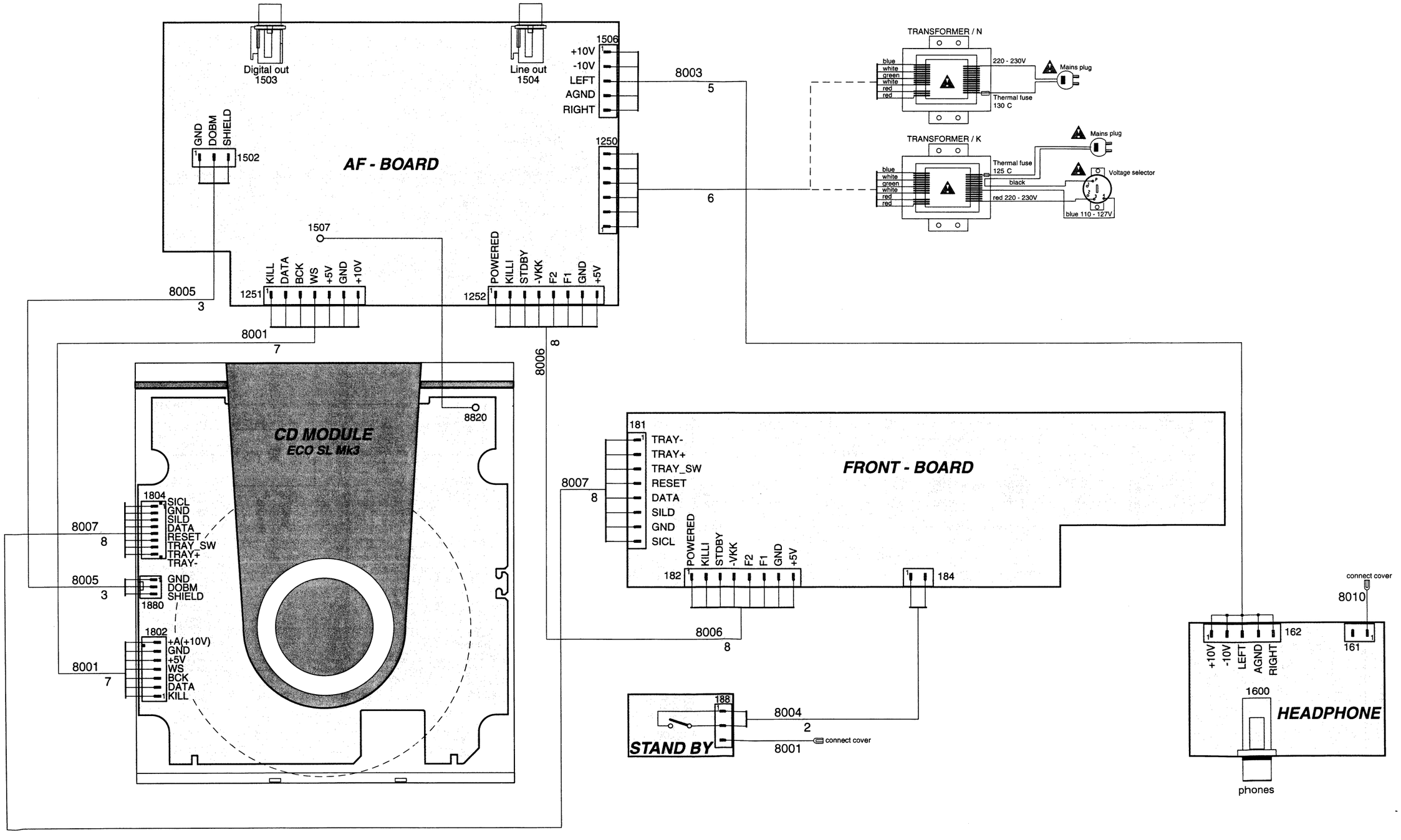
# Abbreviations CD Part

### SAA7372 – DECODER AND DIGITAL SERVO IC CD7

| *Pin* | *Name* | *Direction* | *Description* |
|---|---|---|---|
| 1 | VSSA1 | GND | supply (analog) of CD7 |
| 2 | VDDA1 | +4V | supply (analog) of CD7 |
| 3 | D1 | HF-preamp → CD7 | unipolar current input (central diode signal input) |
| 4 | D2 | HF-preamp → CD7 | unipolar current input (central diode signal input) |
| 5 | D3 | HF-preamp → CD7 | unipolar current input (central diode signal input) |
| 6 | VRL | GND | reference input for ADC |
| 7 | D4 | HF-preamp → CD7 | unipolar current input (central diode signal input) |
| 8 | R1 | HF-preamp → CD7 | unipolar current input (satellite diode signal input) |
| 9 | R2 | HF-preamp → CD7 | unipolar current input (satellite diode signal input) |
| 10 | IREFT | → CD7 | current reference for calibration ADC |
| 11 | VRH | not connected | reference output from ADC |
| 12 | VSSA2 | GND | supply (analog) of CD7 |
| 13 | SELPLL | +4V | selects whether internal clock multiplier PLL is used |
| 14 | ISLICE | CD7 → | current feedback from data slicer |
| 15 | HFIN | → CD7 | comparator signal input |
| 16 | VSSA3 | GND | supply (analog) of CD7 |
| 17 | HFREF | → CD7 | comparator common mode input |
| 18 | IREF | → CD7 | reference current pin (nom. VDD/2) |
| 19 | VDDA2 | +4V | supply (analog) of CD7 |
| 20 | TEST1 | GND | test control input |
| 21 | CRIN | X-Tal → CD7 | crystal/resonator input |
| 22 | CDOUT | X-Tal → CD7 | crystal/resonator output |
| 23 | TEST2 | GND | test control input |
| 24 | CL16 | not connected | 16.9344MHz system clock output |
| 25 | CL11 | not connected | 11.2896MHz or 5.6448MHz clock output (3-state) |
| 26 | RA | CD7 → servo driver | radial actuator output |
| 27 | FO | CD7 → servo driver | focus actuator output |
| 28 | SL | CD7 → servo driver | slide actuator output |
| 29 | TEST3 | GND | test control input |
| 30 | VDD1P | +4V | supply (digital) of CD7 |
| 31 | DOBM | CD7 → digital output | bi-phase mark output (3-state) |
| 32 | VSS1 | GND | supply (digital) of CD7 |
| 33 | MOTO1 | CD7 → servo driver | motor output1 of CD7; versatile (3-state) |
| 34 | MOTO2 | CD7 → servo driver | motor output2 of CD7; versatile (3-state) |
| 35 | SBSY | not connected | subcode block sync (3-state) |
| 36 | SFSY | not connected | subcode frame sync (3-state) |
| 37 | RCK | GND | subcode clock input |
| 38 | SUB | not connected | P to W subcode bits (3-state) |
| 39 | VSS2 | GND | supply (digital) of CD7 |
| 40 | V5 | not connected | versatile output pin of CD7 |
| 41 | V4 | not connected | versatile output pin of CD7 |
| 42 | V3 | not connected | versatile output pin of CD7 (open drain) |
| 43 | KILL | CD7 → | kill output; programmable (open drain) |
| 44 | MISC | not connected | C2 error flag; output only defined in CD-ROM modes (3-state) |
| 45 | DATA | CD7 → DAC | serial data output (3-state) |
| 46 | WCLK | CD7 → DAC | word clock output (3-state) |
| 47 | VDD2P | +4V | supply (digital) of CD7 |
| 48 | BCLK | CD7 → DAC | serial bit clock output (3-state) |
| 49 | VSS3 | GND | supply (digital) of CD7 |
| 50 | CL4 | not connected | 4.2336MHz µP clock output |
| 51 | SDA | µP → CD7 | µP interface data I/O line (open drain output) |
| 52 | SCL | µP → CD7 | µP interface clock line |
| 53 | RAB | µP → CD7 | µP interface R/W and load control line |
| 54 | SILD | µP → CD7 | µP interface R/W and load control line |
| 55 | NC | | no connection |
| 56 | VSS4 | GND | supply (digital) of CD7 |
| 57 | RESET | µP → CD7 | power-on reset input (active low) |
| 58 | STATUS | not connected | servo interrupt request line/CD7 status register output (open drain) |
| 59 | VDD3C | +4V | supply core (digital) |
| 60 | C2FAIL | not connected | indication of correction failure (open drain) |
| 61 | CFLG | not connected | correction flag output (open drain) |
| 62 | V1 | → CD7 | versatile input pin |
| 63 | V2 | → CD7 | versatile input pin |
| 64 | LDON | CD7 → 7820 | laser drive on output (open drain) |

6-1

## WIRING DIAGRAM



7-1

## AF Board / Supply part

TRANSFORMER /N

MAINS PLUG

220 - 230V

Thermal Fuse 130 C

blue
white
green
white
red
red

MAINS PLUG

TRANSFORMER /K

Thermal Fuse 125 C

black

red 220 - 240V

blue 110-127V

blue
white
green
white
red
red

1250

EH-B

F560
F561 5V~
F562
F563
F564 9,5V~
F565 9,5V~

1255 T630mA

1256 T630mA

3251 470R
3252 470R
6251 BZX55-C4V7
3253 22K
D
7250 BC327-40
-31,4V
-27,8V
2250 470n
-28,5V
6252 1N4003
F566
3254 4K7
3255 2K2
3557 6R8
220u 2251
D2
6250 BZX79-C27
D2

F1
F2
5V~
-27,8V
-VKK

2252 22n
6253 1N4003GP
6254 1N4003GP
2253 22n
2256 22n
6255 1N4003GP
6256 1N4003GP
2257 22n

3260 5R6
10,2V
7251 L7805CV
VIN VOUT
10,7V
+10V
5,6V
+5V
0,6V
6260 1N4003
2255 100n
2254 4m7
A

6257 1N4003
6258 1N4003
-10V
-11,7V
3m3 2258

3256 1K
3,4V
7252 BC558C
3,9V
3257 4K7
KILLI
-8,3V
2259 220u
6259 BZX79-C3V9
D
3258 4K7
F567
F568
KILLP
POWERED

TO/FROM AF BOARD / DAC PART

EVM

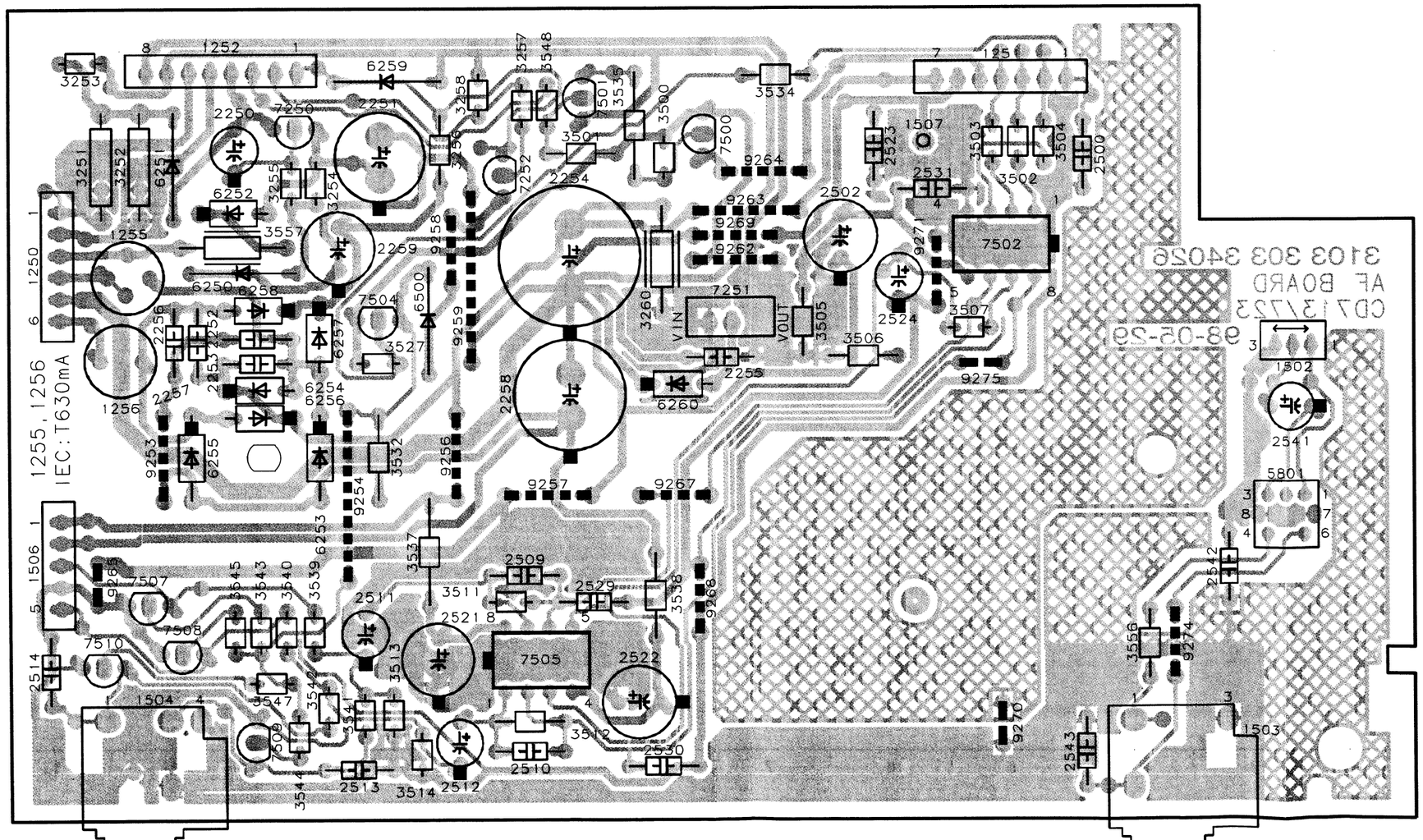
DC voltages measured in Play mode

1250 B4
1255 C5
1256 D5
2250 B6
2251 B5
2252 C6
2253 C6
2254 D7
2255 D8
2256 D6
2257 D6
2258 D7
2259 E5
3251 A5
3252 A5
3253 A5
3254 B6
3255 B6
3256 E6
3257 E7
3258 E7
3260 C7
3557 B4
6250 C6
6251 A6
6252 B5
6253 C6
6254 C6
6255 D6
6256 D6
6257 D5
6258 D5
6259 E6
6260 D8
7250 A6
7251 C8
7252 E6
F560 C4
F561 C4
F562 C4
F563 C4
F564 C4
F565 C4
F566 B5
F567 E6
F568 E6

7-2

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1250 A1 | 2250 A1 | 2500 A4 | 2523 A3 | 3253 A1 | 3503 A4 | 3532 A2 | 3544 B1 | 6253 B2 | 7251 A3 | 7510 B1 | 9265 B1 |
| 1251 A4 | 2251 A2 | 2502 A3 | 2524 A3 | 3254 A2 | 3504 A4 | 3534 A3 | 3545 B1 | 6254 A2 | 7252 A2 | 9253 A1 | 9267 A3 |
| 1252 A1 | 2252 A1 | 2509 B2 | 2529 B2 | 3255 A1 | 3505 A3 | 3535 A3 | 3547 B1 | 6255 A1 | 7500 A3 | 9254 A2 | 9268 B3 |
| 1255 A1 | 2253 A1 | 2510 B2 | 2530 B3 | 3256 A2 | 3506 A3 | 3537 B2 | 3548 A2 | 6256 A2 | 7501 A2 | 9256 A2 | 9269 A3 |
| 1256 A1 | 2254 A2 | 2511 B2 | 2531 A4 | 3257 A2 | 3507 A4 | 3538 B3 | 3556 B4 | 6257 A2 | 7502 A4 | 9257 A2 | 9270 B4 |
| 1502 A4 | 2255 A3 | 2512 B2 | 2541 A4 | 3258 A2 | 3511 B2 | 3539 B2 | 3557 A1 | 6258 A1 | 7504 A2 | 9258 A2 | 9271 A4 |
| 1503 B4 | 2256 A1 | 2513 B2 | 2542 B4 | 3260 A3 | 3512 B2 | 3540 B1 | 5801 A4 | 6259 A2 | 7505 B2 | 9259 A2 | 9274 B4 |
| 1504 B1 | 2257 A1 | 2514 B1 | 2543 B4 | 3500 A3 | 3513 B2 | 3541 B2 | 6250 A1 | 6260 A3 | 7507 B1 | 9262 A3 | 9275 A4 |
| 1506 B1 | 2258 A2 | 2521 B2 | 3251 A1 | 3501 A2 | 3514 B2 | 3542 B2 | 6251 A1 | 6500 A2 | 7508 B1 | 9263 A3 | |
| 1507 A4 | 2259 A2 | 2522 B3 | 3252 A1 | 3502 A4 | 3527 A2 | 3543 B1 | 6252 A1 | 7250 A1 | 7509 B1 | 9264 A3 | |

AF Board Componentside view



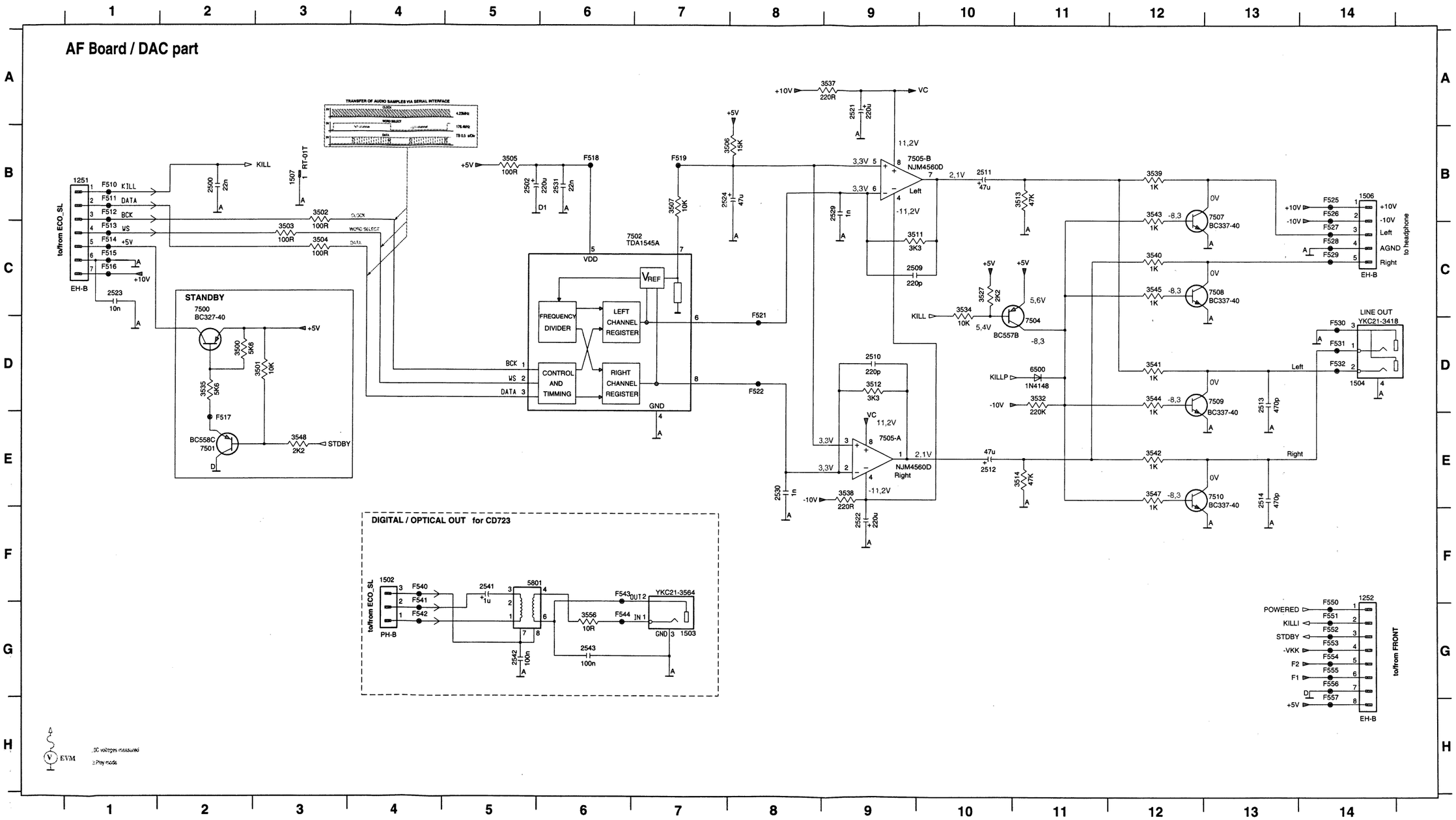

This assembly drawing shows a summary of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

AF Board stage .6 19990505

7-3

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1251 B1 | 1504 D14 | 2502 B5 | 2512 E10 | 2522 F9 | 2530 E8 | 3500 D2 | 3504 C3 | 3511 C9 | 3527 C10 | 3537 A9 | 3541 D12 | 3545 C12 | 5801 F5 | 7502 C6 | 7507 B13 | F510 B1 | F514 C1 | F518 B6 | F525 B14 | F529 C14 | F540 F4 | F544 G6 | F553 G14 | F557 H14 |
| 1252 F14 | 1506 B14 | 2509 C9 | 2513 D13 | 2523 C1 | 2531 B6 | 3501 D3 | 3505 B5 | 3512 D9 | 3532 D11 | 3538 E9 | 3542 E12 | 3547 E12 | 6500 D11 | 7504 D11 | 7506 C13 | F511 B1 | F515 C1 | F519 B7 | F526 B14 | F530 D14 | F541 G4 | F550 G14 | F554 G14 | |
| 1502 F4 | 1507 B3 | 2510 D9 | 2514 E13 | 2524 B7 | 2541 F5 | 3502 B3 | 3506 B7 | 3513 B11 | 3534 C10 | 3539 B12 | 3543 B12 | 3548 E3 | 7500 C2 | 7505-A E9 | 7509 D13 | F512 B1 | F516 C1 | F521 D8 | F527 C14 | F531 D14 | F542 G4 | F551 G14 | F555 G14 | |
| 1503 G7 | 2500 B2 | 2511 B10 | 2521 A9 | 2529 B9 | 2542 G5<br>2543 G6 | 3503 C3 | 3507 B7 | 3514 E11 | 3535 D2 | 3540 C12 | 3544 D12 | 3556 G6 | 7501 E2 | 7505-B B9 | 7510 E13 | F513 C1 | F517 E2 | F522 D8 | F528 C14 | F532 D14 | F543 F6 | F552 G14 | F556 G14 | |

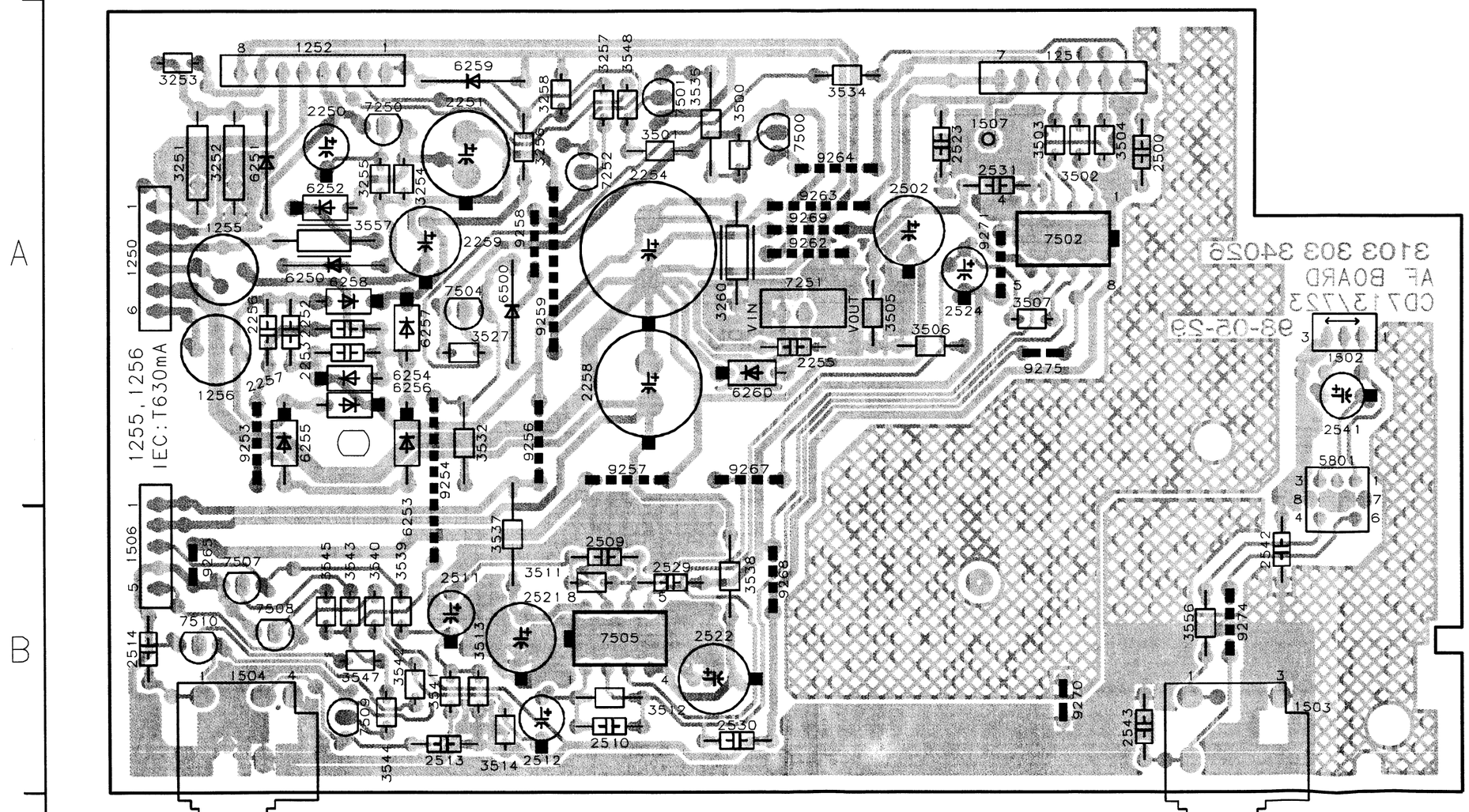
## AF Board / DAC part

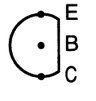


7-4

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1250 A1 | 2250 A1 | 2500 A4 | 2523 A3 | 3253 A1 | 3503 A4 | 3532 A2 | 3544 B1 | 6253 B2 | 7251 A3 | 7510 B1 | 9265 B1 |
| 1251 A4 | 2251 A2 | 2502 A3 | 2524 A3 | 3254 A2 | 3504 A4 | 3534 A3 | 3545 B1 | 6254 A2 | 7252 A2 | 9253 A1 | 9267 A3 |
| 1252 A1 | 2252 A1 | 2509 B2 | 2529 B2 | 3255 A1 | 3505 A3 | 3535 A3 | 3547 B1 | 6255 A1 | 7500 A3 | 9254 A2 | 9268 B3 |
| 1255 A1 | 2253 A1 | 2510 B2 | 2530 B3 | 3256 A2 | 3506 A3 | 3537 B2 | 3548 A2 | 6256 A2 | 7501 A2 | 9256 A2 | 9269 A3 |
| 1256 A1 | 2254 A2 | 2511 B2 | 2531 A4 | 3257 A2 | 3507 A4 | 3538 B3 | 3556 B4 | 6257 A2 | 7502 A4 | 9257 A2 | 9270 B4 |
| 1502 A4 | 2255 A3 | 2512 B2 | 2541 A4 | 3258 A2 | 3511 B2 | 3539 B2 | 3557 A1 | 6258 A1 | 7504 A2 | 9258 A2 | 9271 A4 |
| 1503 B4 | 2256 A1 | 2513 B2 | 2542 B4 | 3260 A3 | 3512 B2 | 3540 B1 | 5801 A4 | 6259 A2 | 7505 B2 | 9259 A2 | 9274 B4 |
| 1504 B1 | 2257 A1 | 2514 B1 | 2543 B4 | 3500 A3 | 3513 B2 | 3541 B2 | 6250 A1 | 6260 A3 | 7507 B1 | 9262 A3 | 9275 A4 |
| 1506 B1 | 2258 A2 | 2521 B2 | 3251 A1 | 3501 A2 | 3514 B2 | 3542 B2 | 6251 A1 | 6500 A2 | 7508 B1 | 9263 A3 | |
| 1507 A4 | 2259 A2 | 2522 B3 | 3252 A1 | 3502 A4 | 3527 A2 | 3543 B1 | 6252 A1 | 7250 A1 | 7509 B1 | 9264 A3 | |

## AF Board Componentside view




This assembly drawing shows a summary of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

AF Board stage .6 19990505

7-5

# FRONT BOARD

1800 20U32101TA

7800 TMP87CM71F

6802, 6803, 6810 preliminary

8BIT CPU

DISPLAY-DRIVERS

ROM

RAM

CLOCK

A/D Converter

8.0 MHz

STAND BY 188 1840

OPENCLOSE 1820

GND

DIPMATE

to/from ECO_SL

to/from AF

TRAY-

TRAY+

TRAY_SW

CD_PORE

CD_DATA

CD_SILD

DGND

CD_SICL

POWERED

KILLI

STDBY

-VKK

F2

F1

+5V

FTD

VDD

VKK

-18V

4.9V

REPEAT

SHUFFLE

FADE

PLAY

PRGM

EDIT

PEAK

STOP

PREV

PAUSE

NEXT

TIME

CD723 only

CD713 only

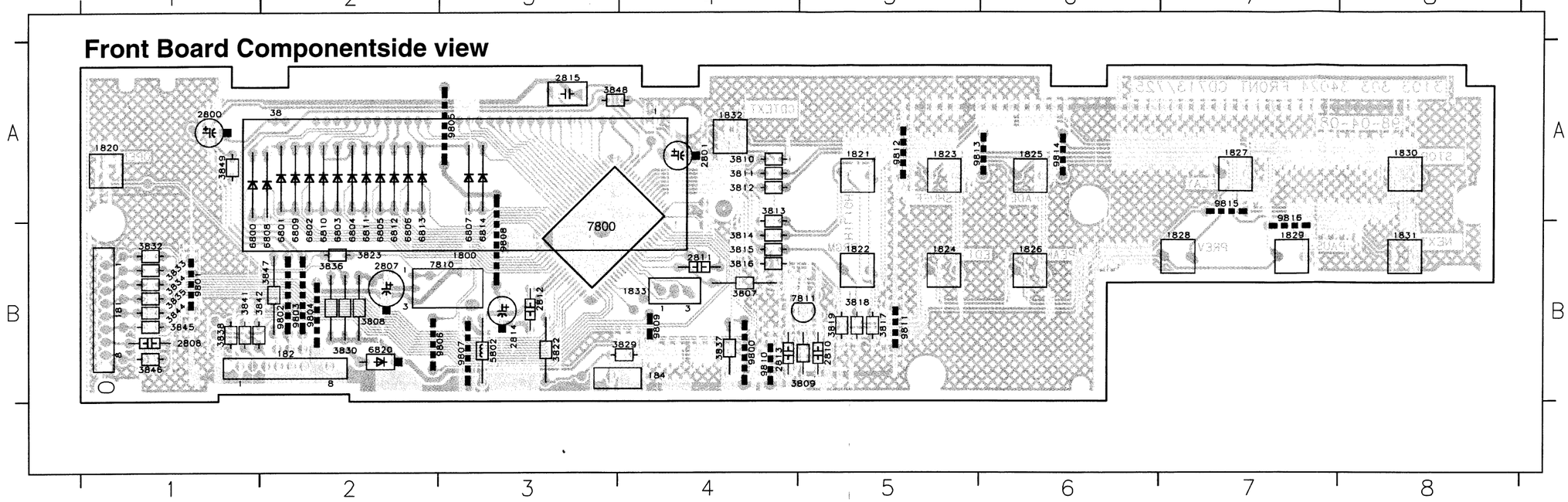
| | | | |
|---|---|---|---|
| 181 | F1 | F810 | H2 |
| 182 | H1 | F811 | H2 |
| 184 | E1 | F812 | H2 |
| 1800 | B9 | F813 | I2 |
| 1820 | F1 | F814 | I2 |
| 1821 | F11 | F815 | I2 |
| 1822 | G11 | F816 | E2 |
| 1823 | F12 | F817 | G6 |
| 1824 | G12 | F818 | G8 |
| 1825 | F12 | F819 | G8 |
| 1826 | G12 | F820 | G9 |
| 1827 | F13 | F821 | G9 |
| 1828 | G11 | F822 | G10 |
| 1829 | G12 | F823 | I7 |
| 1830 | G13 | F824 | I8 |
| 1831 | G12 | F825 | I8 |
| 1832 | G13 | F826 | I2 |
| 1833 | G7 | F827 | G7 |

2800 B5
2801 B10
2807 I8
2808 G2
2810 I7
2811 H8
2812 E3
2813 I7
2814 E3
2815 D10
3807 H8
3808 H8
3809 I7
3810 E10
3811 E10
3812 E10
3813 F10
3814 F10
3815 F10
3816 F10
3817 F11
3818 G11
3819 G11
3822 F5
3823 F5
3829 E2
3830 E2
3832 F3
3833 F3
3834 F3
3835 G3
3836 E2
3837 G9
3838 H2
3841 H2
3842 H2
3844 G3
3845 G3
3846 G3
3847 D10
3848 A10
3849 A4
5802 E3
6800 C4
6801 C4
6802 C5
6803 C5
6804 C5
6805 C6
6806 C6
6807 C7
6808 C4
6809 C5
6810 C5
6811 C6
6812 C6
6813 C6
6814 C7
6820 I2
7800 D6
7810 I9
7811 I8
9800 G9
F800 F2
F801 F2
F802 F2
F803 F2
F804 F2
F805 G2
F806 G2
F807 G2
F808 H2
F809 H2

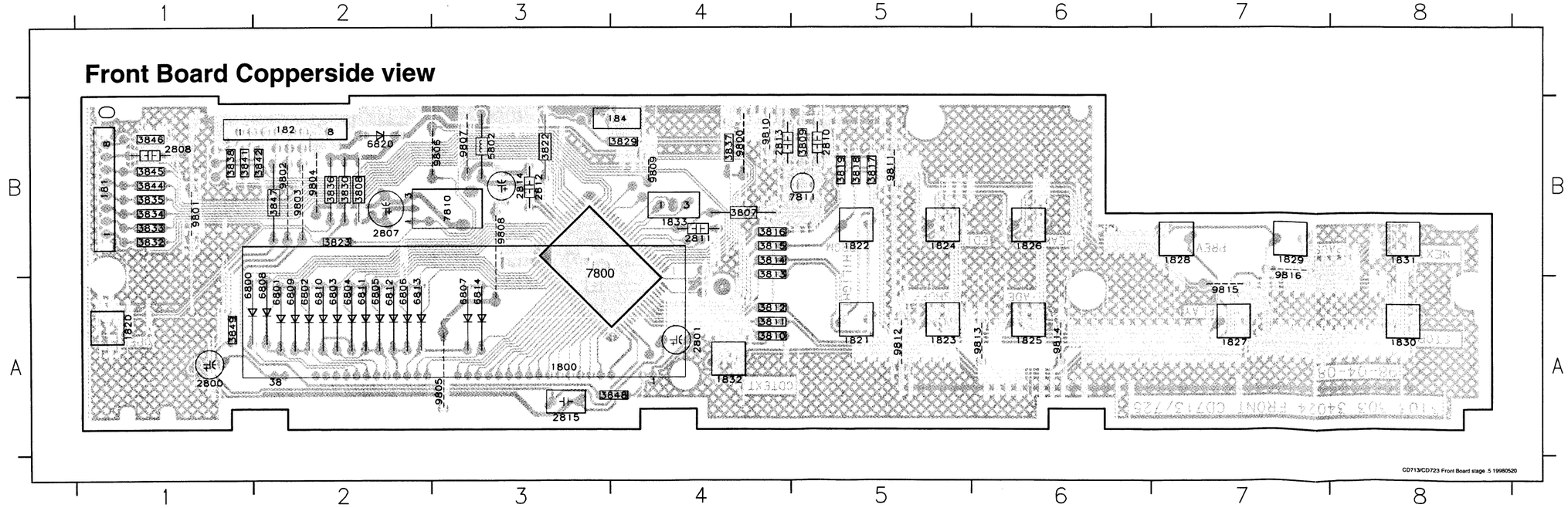
7-6

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 181 B1 | 1823 A5 | 1830 A8 | 2808 B1 | 3807 B4 | 3814 B4 | 3823 B2 | 3836 B2 | 3846 B1 | 6802 A2 | 6809 A2 | 7800 A3 | 9804 B2 | 9811 B5 |
| 182 B2 | 1824 B5 | 1831 B8 | 2810 B5 | 3808 B2 | 3815 B4 | 3829 B4 | 3837 B4 | 3847 B2 | 6803 A2 | 6810 A2 | 7810 B3 | 9805 A3 | 9812 A5 |
| 184 B3 | 1825 A6 | 1832 A4 | 2811 B4 | 3809 B5 | 3816 B4 | 3830 B2 | 3838 B1 | 3848 A3 | 6804 A2 | 6811 A2 | 7811 B5 | 9806 B2 | 9813 A6 |
| 1800 A3 | 1826 B6 | 1833 B4 | 2812 B3 | 3810 A4 | 3817 B5 | 3832 B1 | 3841 B1 | 3849 A1 | 6805 A2 | 6812 A2 | 9800 B4 | 9807 B3 | 9814 A6 |
| 1820 A1 | 1827 A7 | 2800 A1 | 2813 B4 | 3811 A4 | 3818 B5 | 3833 B1 | 3842 B1 | 5802 B3 | 6806 A2 | 6813 A2 | 9801 B1 | 9808 B3 | 9815 A7 |
| 1821 A5 | 1828 B7 | 2801 A4 | 2814 B3 | 3812 A4 | 3819 B5 | 3834 B1 | 3844 B1 | 6800 A1 | 6807 A3 | 6814 A3 | 9802 B2 | 9809 B4 | 9816 B7 |
| 1822 B5 | 1829 B7 | 2807 B2 | 2815 A3 | 3813 B4 | 3822 B3 | 3835 B1 | 3845 B1 | 6801 A2 | 6808 A2 | 6820 B2 | 9803 B2 | 9810 B4 | |

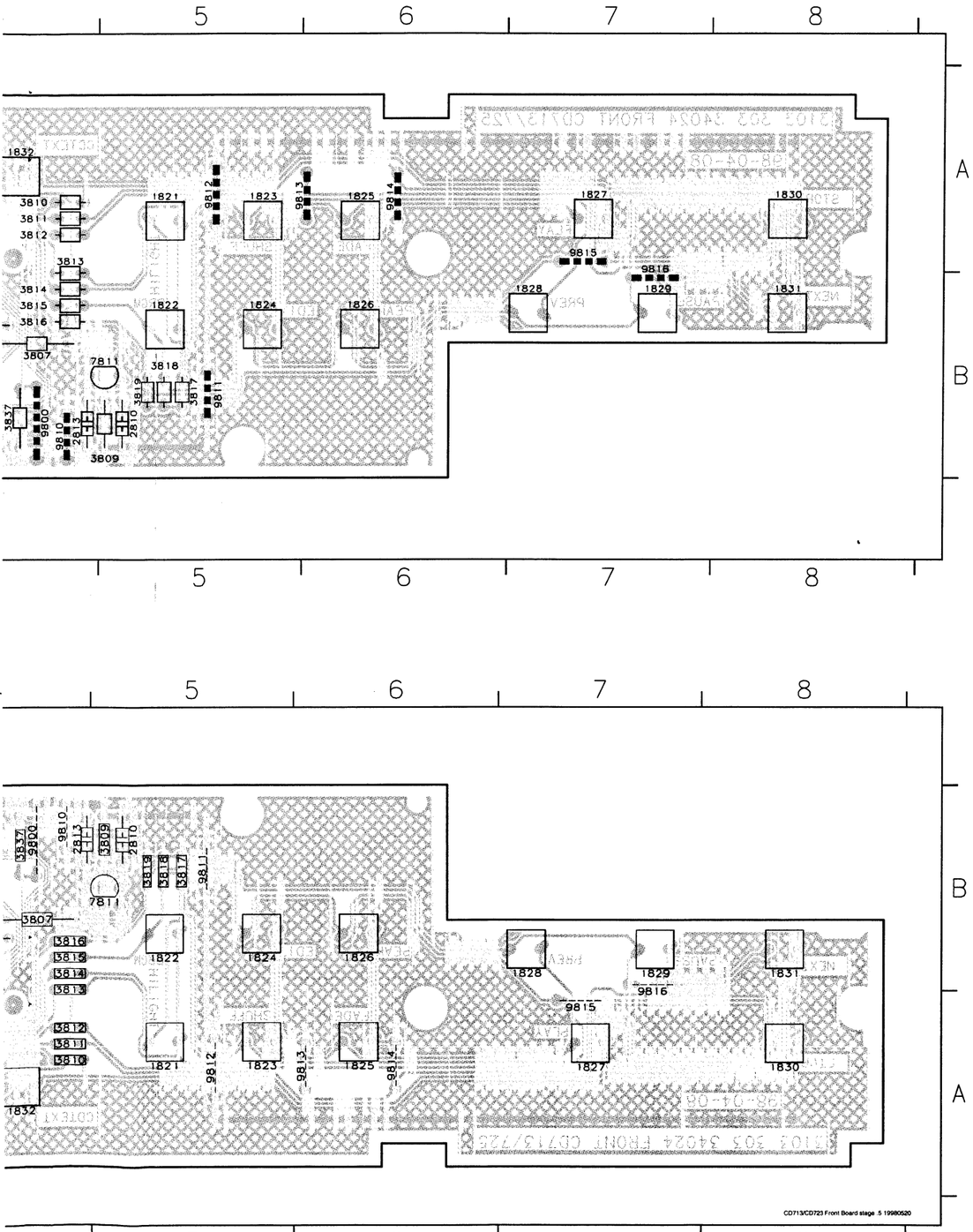
## Front Board Componentside view




## Front Board Copperside view



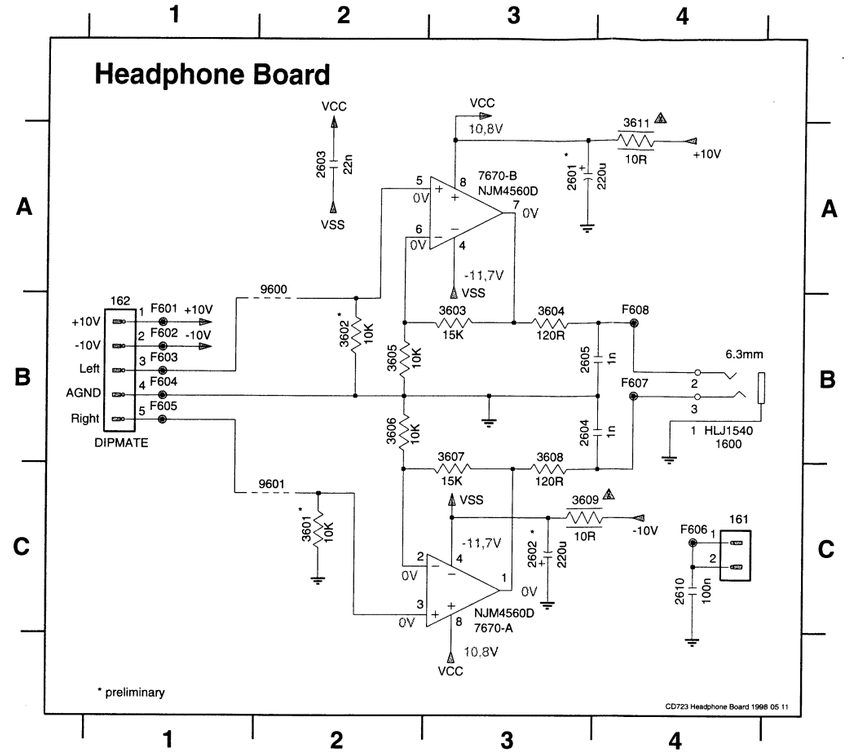
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 23 B2 | 3836 B2 | 3846 B1 | 6802 A2 | 6809 A2 | 7800 A3 | 9804 B2 | 9811 B5 |
| 29 B4 | 3837 B4 | 3847 B2 | 6803 A2 | 6810 A2 | 7810 B3 | 9805 A3 | 9812 A5 |
| 30 B2 | 3838 B1 | 3848 A3 | 6804 A2 | 6811 A2 | 7811 B5 | 9806 B2 | 9813 A6 |
| 32 B1 | 3841 B1 | 3849 A1 | 6805 A2 | 6812 A2 | 9800 B4 | 9807 B3 | 9814 A6 |
| 33 B1 | 3842 B1 | 5802 B3 | 6806 A2 | 6813 A2 | 9801 B1 | 9808 B3 | 9815 A7 |
| 34 B1 | 3844 B1 | 6800 A1 | 6807 A3 | 6814 A3 | 9802 B2 | 9809 B4 | 9816 B7 |
| 35 B1 | 3845 B1 | 6801 A2 | 6808 A2 | 6820 B2 | 9803 B2 | 9810 B4 | |



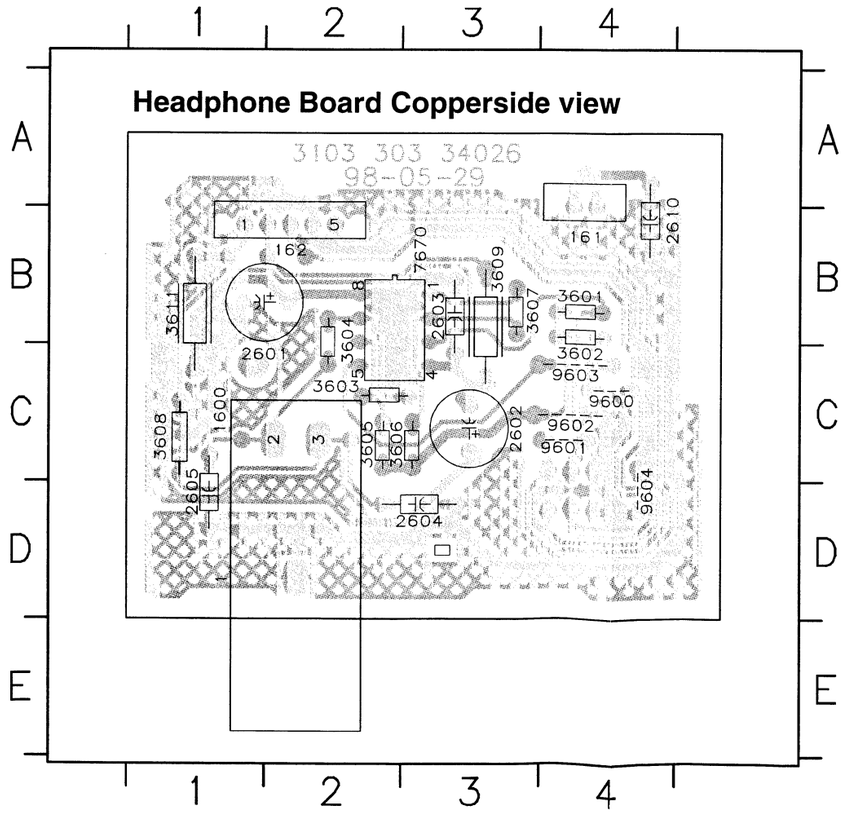









| | |
|---|---|
| 161 | C4 |
| 162 | B1 |
| 1600 | B4 |
| 2601 | A3 |
| 2602 | C3 |
| 2603 | A2 |
| 2604 | B3 |
| 2605 | B3 |
| 2610 | C4 |
| 3601 | C2 |
| 3602 | B2 |
| 3603 | B3 |
| 3604 | B3 |
| 3605 | B2 |
| 3606 | B2 |
| 3607 | B3 |
| 3608 | B3 |
| 3609 | C3 |
| 3611 | A4 |
| 7670-A | C3 |
| 7670-B | A3 |
| 9600 | B2 |
| 9601 | C2 |




| | |
|---|---|
| 161 | B4 |
| 162 | B2 |
| 1600 | D2 |
| 2601 | B2 |
| 2602 | C3 |
| 2603 | B3 |
| 2604 | D3 |
| 2605 | D1 |
| 2610 | B4 |
| 3600 | D4 |
| 3601 | B4 |
| 3602 | B4 |
| 3603 | C2 |
| 3604 | B2 |
| 3605 | D2 |
| 3606 | D3 |
| 3607 | B3 |
| 3608 | C1 |
| 3609 | B3 |
| 3611 | B1 |
| 7670 | B3 |
| 9600 | C4 |
| 9601 | C4 |
| 9602 | C4 |
| 9603 | C4 |
| 9604 | D4 |

7-7

# CD-BOARD (ECO-SL Mk3)

CD R/W Front End

7819 PC74HCU04D

SUPPLY FOR 7819

eye-pattern

TB=0.5 µs/DIV

CFLG output (open drain) for BLER measurement

"L"=dig out, "H"= no dig out

resistor for flap version only

not for flap

CONTROL INTERFACE

JST EH

TRAY-

TRAY+

TRAY_SW

RESET

DATA

SILD

SICL

GND

KILL

BCLK

WS

SDA

TDA1302T

SVDDA1

LD_ON

(H = Laser On)

(H = CD-R/W)

from 7860/Pin 41

INNERSWITCH

MICROPROCESSOR INTERFACE

VERSATILE PINS

SERIAL DATA INTERFACE

CONTROL PART

PRE-PROC.

FUNCTION CONTROL

ERROR CORRECTION

FLAGS

EBU INT.

EFM DEMOD.

SRAM

RAM ADDR.

DIGITAL PLL

MOTOR CONTROL

FRONT END

TIMING

OUTPUT STAGES

AUDIO PROCESSOR

PEAK DETECT

SUBCODE PROCESSOR

SAA7378

ADC

Vref

DALAS

SERVO-DRIVER TDA7073A

MOTOR-DRIVER TDA7073A

TRACK

FOCUS

SLIDE

TURNTABLE

PDM

during focus search

during speed up

play

brake

SLEDGE

DISC

INNERSWITCH

(to versatile pin 63 of decoder IC)

CD DRIVE
VAM 1201

comm.path

Track

Focus

PTC: +A = 5 ... 13.5V(only for battery powered versions)

NFR: +A = 8 ... 13.5V

only if not CD-TEXT

for coax. out: 33R

for coax out: 3875 = 2k

| Item # | COAX OUT | OPT OUT |
|---|---|---|
| 2890 | 150p | 47p |
| 3894 | no | 10R |
| 3896 | 270 | 220 |
| 3897 | 180R | no |
| 9890 | yes | no |

| for Coaxial: | for Optical: |
|---|---|
| SHIELD | +5l |
| DOBM | DOBM (TTL) |
| EBU_GND | GND |

JST PH

# ... for provision only

7-7

eye-pattern
TB=0.5 µs/DIV
"L"=dig out, "H"= no dig out
CFLG output (open drain) for BLER measurement
INNERSWITCH
MICROPROCESSOR INTERFACE
VERSATILE PINS
SERIAL DATA INTERFACE
AUDIO PROCESSOR
CONTROL PART
PRE-PROC.
FUNCTION CONTROL
ADC
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
SUBCODE PROCESSOR
PEAK DETECT
KILL
PDM
during speed up
play
brake
resistor for flap version only
not for flap
CONTROL INTERFACE
JST EH
only if not CD-TEXT
jumper only present if KILL circuit not stuffed
SUPPLY & AUDIO INTERFACE
Loader
for TRAY Version only
TRAY MOTOR
TRAY SWITCH
Leaf Switch
for FLAP version only
CD TEXT
LC89170M
32kx8 RAM
CPU Inter-face
CRC Check
Timing & Sync Protection
CD-TEXT INTERFACE
JST FE hor
IEC 958
JST PH
for COAXIAL OUT version only
Break-Away PB OPT OUT
Driver IC
SHARP TOSLINK
for OPTICAL OUT version only
Do not split cables!
...DC voltages measured in Play mode
EVM

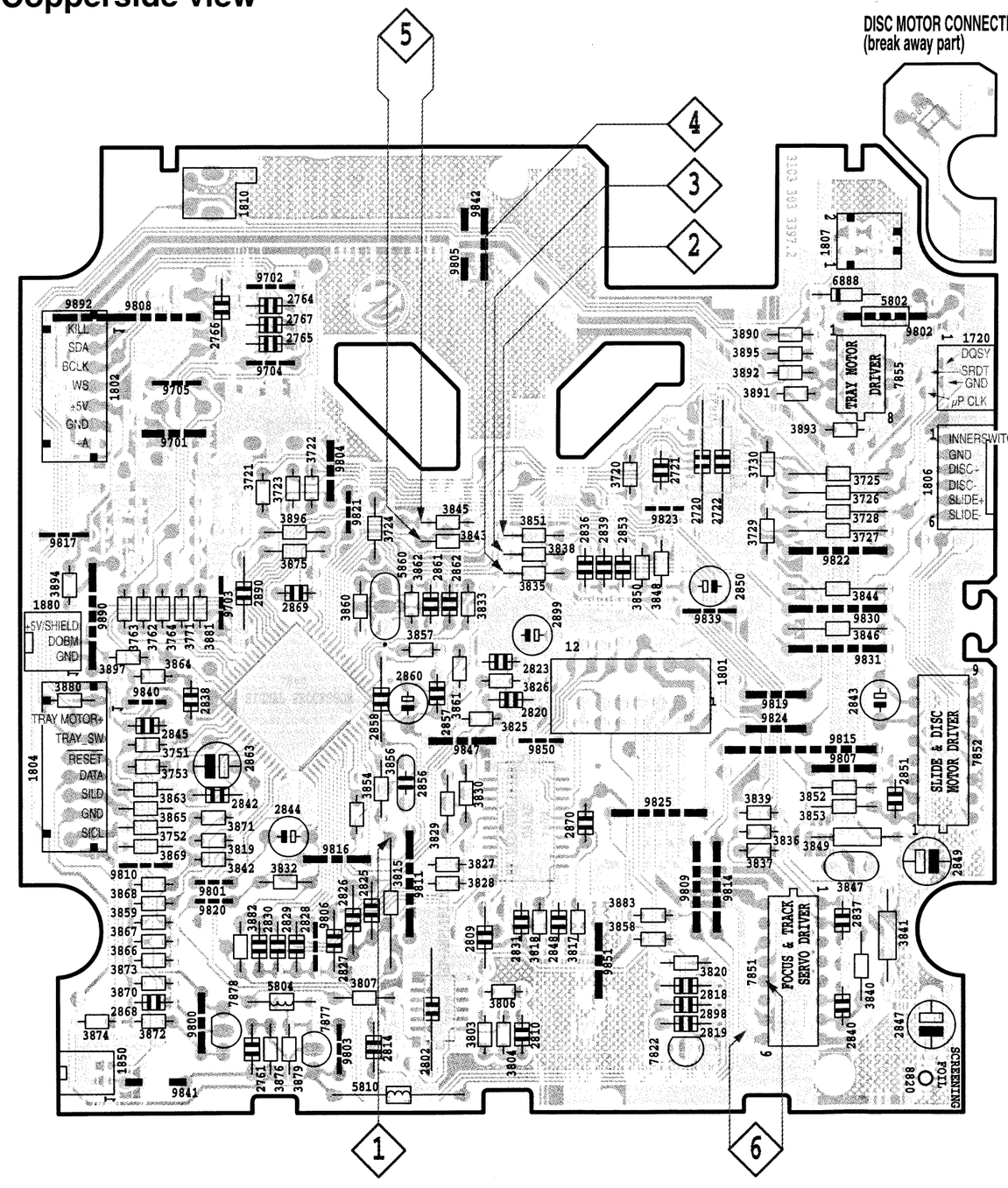
| Item # | COAX OUT | OPT OUT |
|---|---|---|
| 2890 | 150p | 47p |
| 3894 | no | 10R |
| 3896 | 270 | 220 |
| 3897 | 180R | no |
| 9890 | yes | no |

| for Coaxial: | for Optical: |
|---|---|
| SHIELD | +5V |
| DOBM | DOBM (TTL) |
| EBU_GND | GROUND |

for coax out: 3875 = 22R

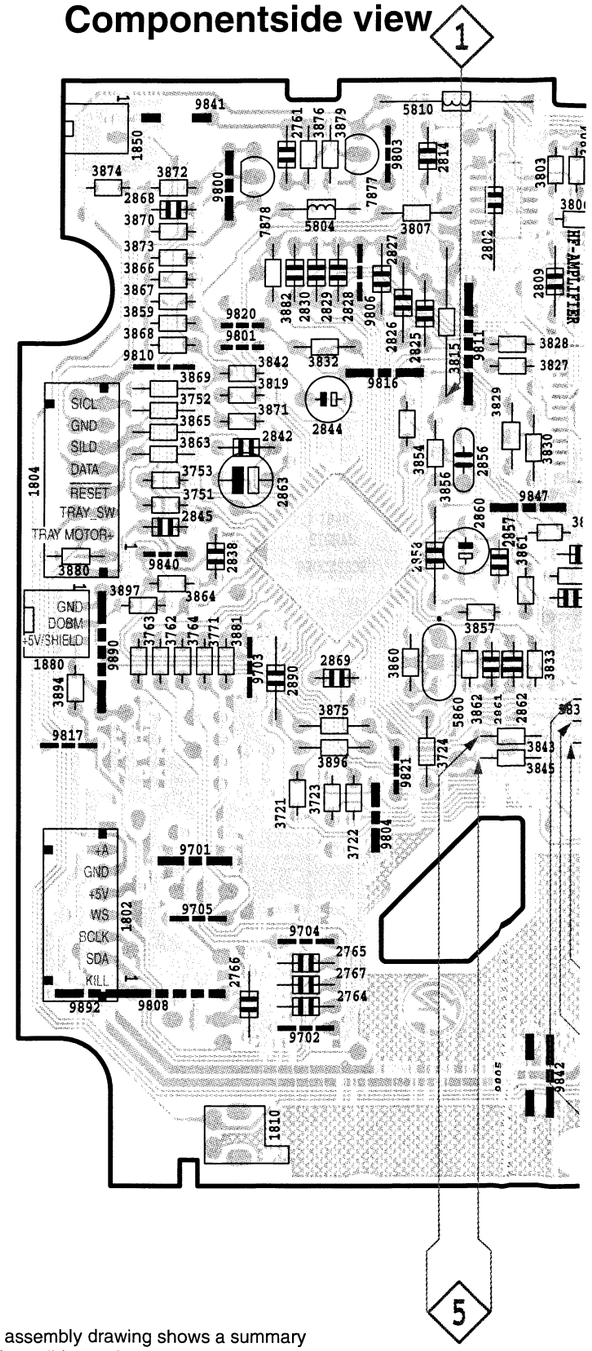
# ... for provision only

# ECO Short Loader Mk3
## Copperside view




17 opt.
1720 C1
1801 D3
1802 C6
1804 E6
1806 C1
1807 B2
1810 B5
1820 B3
1850 F6
1880 D6
1881 opt.
1890 opt.
1895 opt.
2720 C3
2721 C3
2722 C2
2761 F5
2764 B5
2765 B5
2766 B5
2767 B5
2802 F4
2809 E4
2810 F3
2814 F4
2818 F3
2819 F3
2820 D4
2823 D4
2825 E4
2826 E4
2827 E4
2828 F5
2829 F5
2830 F5
2831 E3
2836 D3
2837 E2
2838 D5
2839 D3
2840 F2
2842 E5
2843 D2
2844 E5
2845 D5
2847 F1
2848 E3
2849 E1
2850 D2
2851 E2
2853 D3
2856 E4
2857 D4
2858 D4
2859 opt.
2860 D4
2861 D4
2862 D4
2863 E5
2865 opt.
2868 F5
2869 D5
2870 E3
2890 D5
2891 opt.
2892 opt.
2898 F3
2899 D3
3720 C3
3721 C5
3722 C5
3723 C5
3724 C4
3725 C2
3726 C2
3727 C2
3728 C2
3729 C2
3730 C2
3751 D5
3752 E5
3753 E5
3762 D5
3763 D6
3764 D5
3771 D5
3803 F4
3804 F4
3806 F4
3807 F4
3815 E4
3817 E3
3818 E3
3819 E5
3820 F3
3825 D4
3826 D4
3827 E4
3828 E4
3829 E4
3830 E4
3832 E5
3833 D4
3835 D3
3836 E2
3837 E2
3838 C3
3839 E2
3840 F2
3841 E2
3842 E5
3843 C4
3844 D2
3845 C4
3846 D2
3847 E2
3848 D3
3849 E2
3850 D3
3851 C3
3852 E2
3853 E2
3854 E4
3856 E4
3857 D4
3858 E3
3859 E5
3860 D4
3861 D4
3862 D4
3863 E5
3864 D5
3865 E5
3866 E5
3867 E5
3868 E5
3869 E5
3870 F5
3871 E5
3872 F5
3873 F5
3874 F6
3875 C5
3876 F5
3879 F5
3880 D6
3881 D5
3882 F5
3883 E3
3890 B2
3891 C2
3892 C2
3893 C2
3894 D6
3895 B2
3896 C5
3897 D6
3898 opt.
3899 opt.
5802 B2
5804 F5
5810 F4
5860 D4
5890 opt.
6888 B2
7802 opt.
7814 opt.
7822 F3
7851 F2
7852 D1
7855 C2
7860 opt.
7877 F5
7878 F5
7896 opt.
9701 C5
9702 B5
9703 D5
9704 B5
9705 C5
9800 F5
9801 E5
9802 B2
9803 F4
9804 C4
9805 B4
9806 F5
9807 E2
9808 B5
9809 E3
9810 E5
9811 E4
9814 E2
9815 D2
9816 E4
9817 C6
9819 D2
9820 E5
9821 C4
9822 C2
9823 C3
9824 D2
9825 E3
9830 D2
9831 D2
9839 D2
9840 D5
9841 F5
9842 B4
9847 D4
9850 D3
9851 F3
9890 D6
9892 B6

# Componentside view

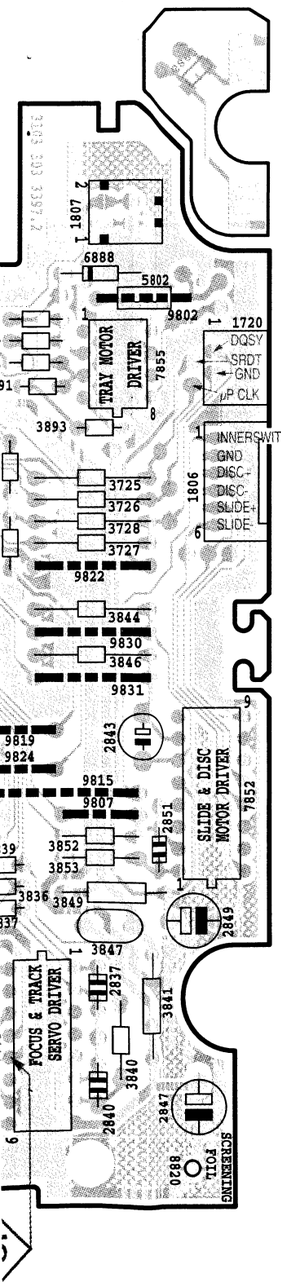


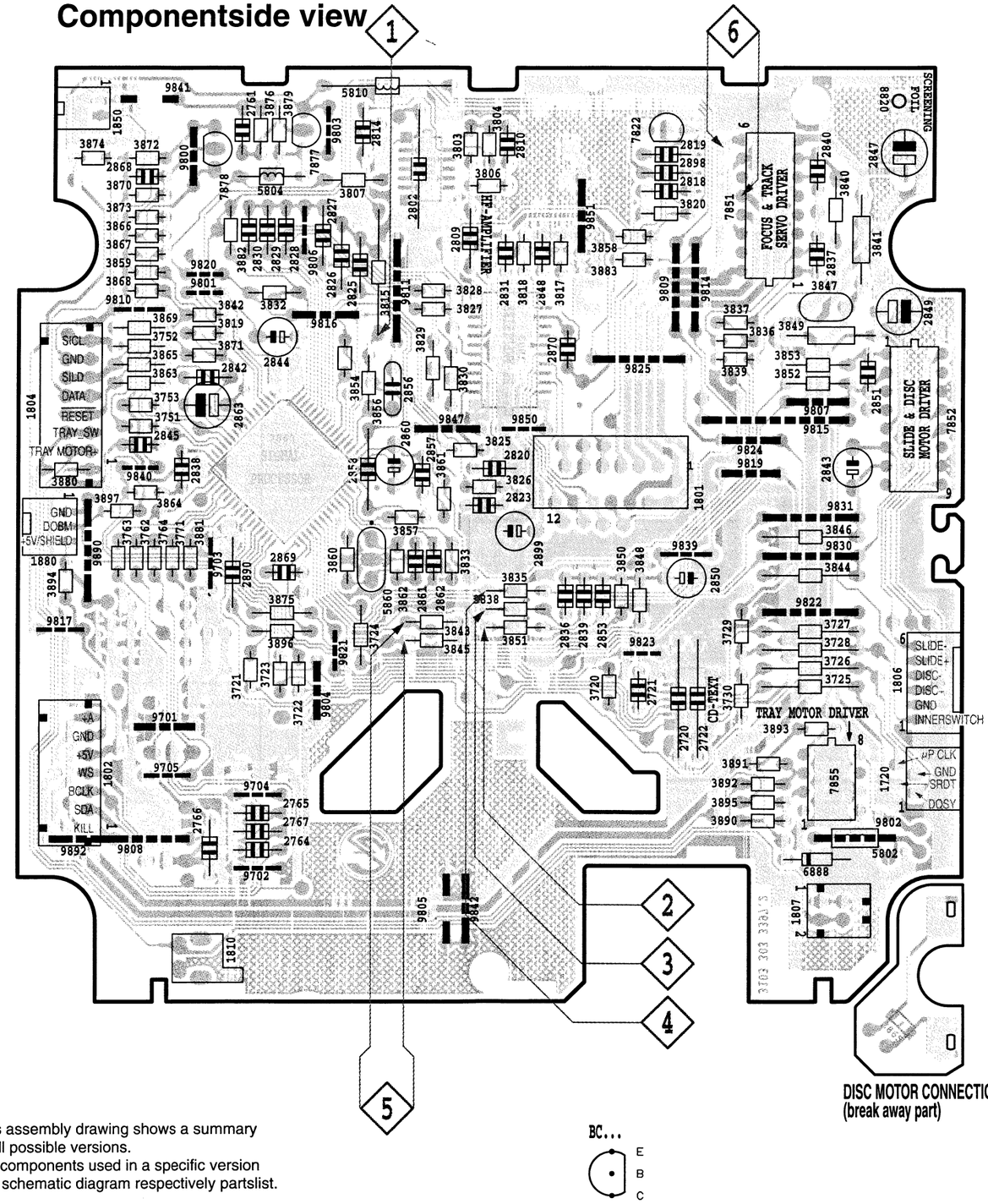

This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

7-8

# Componentside view

DISC MOTOR CONNECTION
(break away part)




DISC MOTOR CONNECTION
(break away part)

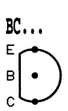


This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

BC...



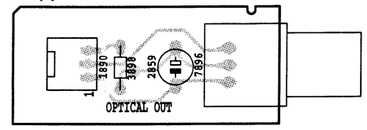

BC...



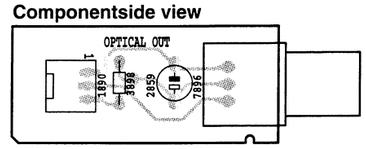

ECO SL Mk3 (R/W&Ils) Layout stage .2 (19980330)

| | | |
|---|---|---|
| 17 opt. | 3844 | D2 |
| 1720 | C1 | 3845 C4 |
| 1801 | D3 | 3846 D2 |
| 1802 | C6 | 3847 E2 |
| 1804 | E6 | 3848 D3 |
| 1806 | C1 | 3849 E2 |
| 1807 | B2 | 3850 D3 |
| 1810 | B5 | 3851 C3 |
| 1820 | B3 | 3852 E2 |
| 1850 | F6 | 3853 E2 |
| 1880 | D6 | 3854 E4 |
| 1881 opt. | | 3856 E4 |
| 1890 opt. | | 3857 D4 |
| 1895 opt. | | 3858 E3 |
| 2720 | C3 | 3859 E5 |
| 2721 | C3 | 3860 D4 |
| 2722 | C2 | 3861 D4 |
| 2761 | F5 | 3862 D4 |
| 2764 | B5 | 3863 E5 |
| 2765 | B5 | 3864 D5 |
| 2766 | B5 | 3865 E5 |
| 2767 | B5 | 3866 E5 |
| 2802 | F4 | 3867 E5 |
| 2809 | E4 | 3868 E5 |
| 2810 | F3 | 3869 E5 |
| 2814 | F4 | 3870 F5 |
| 2818 | F3 | 3871 E5 |
| 2819 | F3 | 3872 F5 |
| 2820 | D4 | 3873 F5 |
| 2823 | D4 | 3874 F6 |
| 2825 | E4 | 3875 C5 |
| 2826 | E4 | 3876 F5 |
| 2827 | E4 | 3879 F5 |
| 2828 | F5 | 3880 D6 |
| 2829 | F5 | 3881 D5 |
| 2830 | F5 | 3882 F5 |
| 2831 | E3 | 3883 E3 |
| 2836 | D3 | 3890 B2 |
| 2837 | E2 | 3891 C2 |
| 2838 | D5 | 3892 C2 |
| 2839 | D3 | 3893 C2 |
| 2840 | F2 | 3894 D6 |
| 2842 | E5 | 3895 B2 |
| 2843 | D2 | 3896 C5 |
| 2844 | E5 | 3897 D6 |
| 2845 | D5 | 3898 opt. |
| 2847 | F1 | 3899 opt. |
| 2848 | E3 | 5802 B2 |
| 2849 | E1 | 5804 F5 |
| 2850 | D2 | 5810 F4 |
| 2851 | E2 | 5860 D4 |
| 2853 | D3 | 5890 opt. |
| 2856 | E4 | 6888 B2 |
| 2857 | D4 | 7802 opt. |
| 2858 | D4 | 7819 opt. |
| 2859 opt. | | 7822 F3 |
| 2860 | D4 | 7851 F2 |
| 2861 | D4 | 7852 D1 |
| 2862 | D4 | 7855 C2 |
| 2863 | E5 | 7860 opt. |
| 2865 opt. | | 7877 F5 |
| 2868 | F5 | 7878 F5 |
| 2869 | D5 | 7896 opt. |
| 2870 | E3 | 9701 C5 |
| 2890 | D5 | 9702 B5 |
| 2891 opt. | | 9703 D5 |
| 2892 opt. | | 9704 B5 |
| 2898 | F3 | 9705 C5 |
| 2899 | D3 | 9800 F5 |
| 3720 | C3 | 9801 E5 |
| 3721 | C5 | 9802 B2 |
| 3722 | C5 | 9803 F4 |
| 3723 | C5 | 9804 C4 |
| 3724 | C4 | 9805 B4 |
| 3725 | C2 | 9806 F5 |
| 3726 | C2 | 9807 E2 |
| 3727 | C2 | 9808 B5 |
| 3728 | C2 | 9809 E3 |
| 3729 | C2 | 9810 E5 |
| 3730 | C2 | 9811 E4 |
| 3751 | D5 | 9814 E2 |
| 3752 | E5 | 9815 D2 |
| 3753 | E5 | 9816 E4 |
| 3762 | D5 | 9817 C6 |
| 3763 | D6 | 9819 D2 |
| 3764 | D5 | 9820 E5 |
| 3771 | D5 | 9821 C4 |
| 3803 | F4 | 9822 C2 |
| 3804 | F4 | 9823 C3 |
| 3806 | F4 | 9824 D2 |
| 3807 | F4 | 9825 E3 |
| 3815 | E4 | 9830 D2 |
| 3817 | E3 | 9831 D2 |
| 3818 | E3 | 9839 D2 |
| 3819 | E5 | 9840 D5 |
| 3820 | F3 | 9841 F5 |
| 3825 | D4 | 9842 B4 |
| 3826 | D4 | 9847 D4 |
| 3827 | E4 | 9850 D3 |
| 3828 | E4 | 9851 F3 |
| 3829 | E4 | 9890 D6 |
| 3830 | E4 | 9892 B6 |
| 3832 | E5 | |
| 3833 | D4 | |
| 3835 | D3 | |
| 3836 | E2 | |
| 3837 | E2 | |
| 3838 | C3 | |
| 3839 | E2 | |
| 3840 | F2 | |
| 3841 | E2 | |
| 3842 | E5 | |
| 3843 | C4 | |

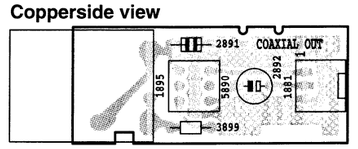
OPTIONAL
FOR SETS WITH OPTICAL OUT
Copperside view



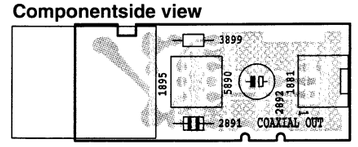

Componentside view



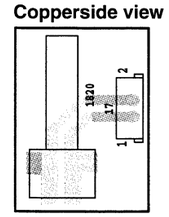

OPTIONAL
FOR SETS WITH COAXIAL OUT
Copperside view



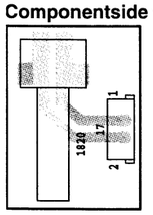

Componentside view




OPTIONAL
FOR FLAP LOADERS
Copperside view



Componentside view



# WARNING

***CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CDM-ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE***
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

***ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.***

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CDM flexfoil from printed board
2. Connect paperclip to CDM flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CDM mechanism
5. Position new CDM mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CDM
8. Connect new flexfoil to print connector (fig.3)

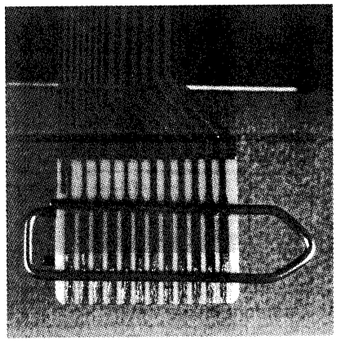


fig.1

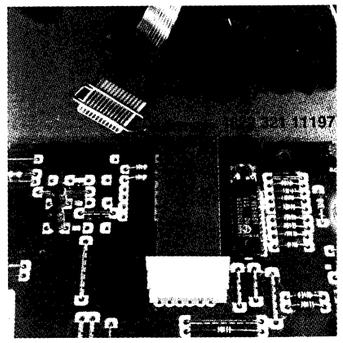


fig.2

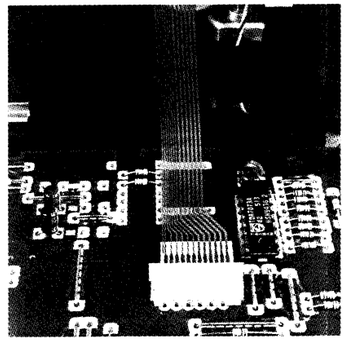
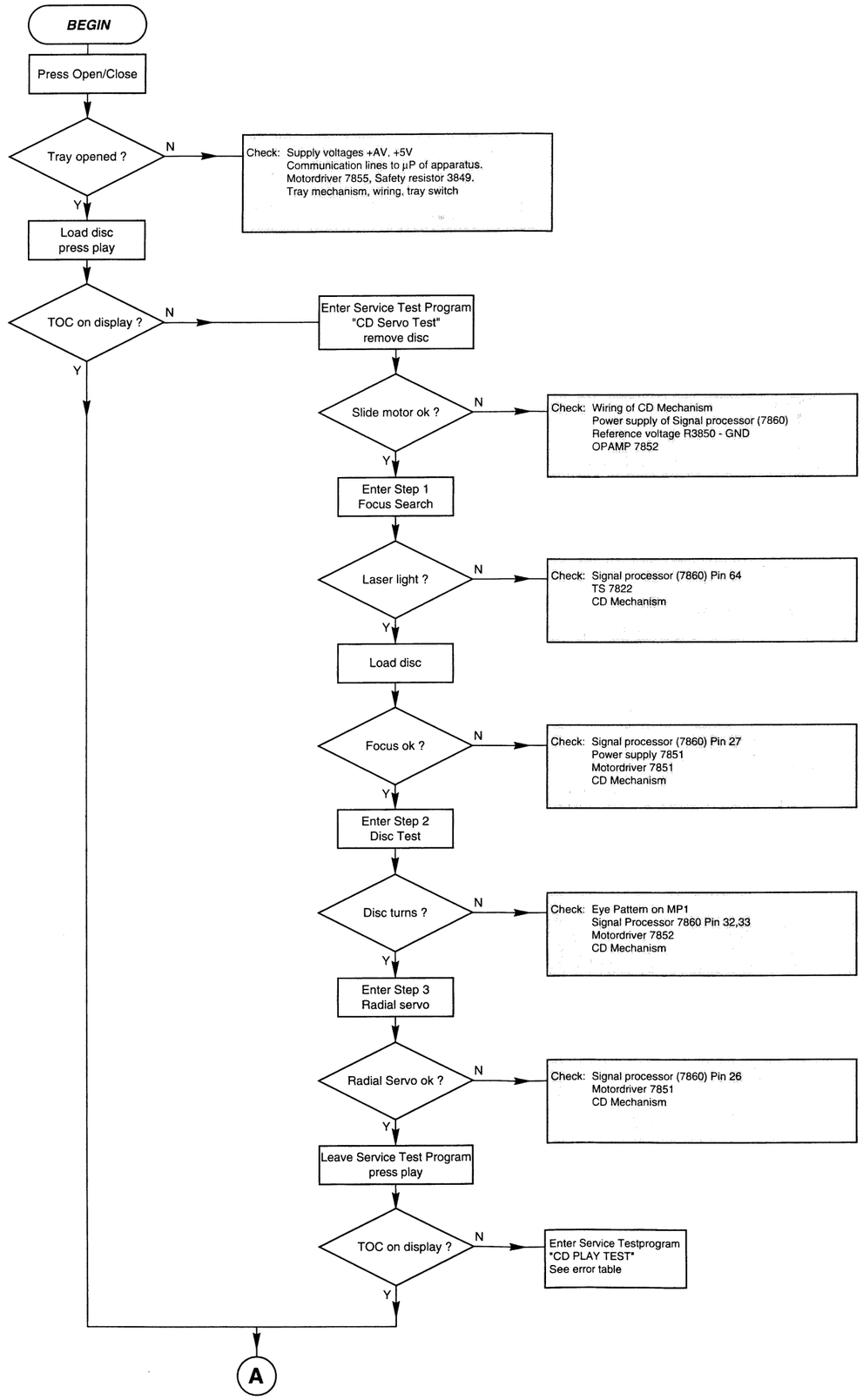


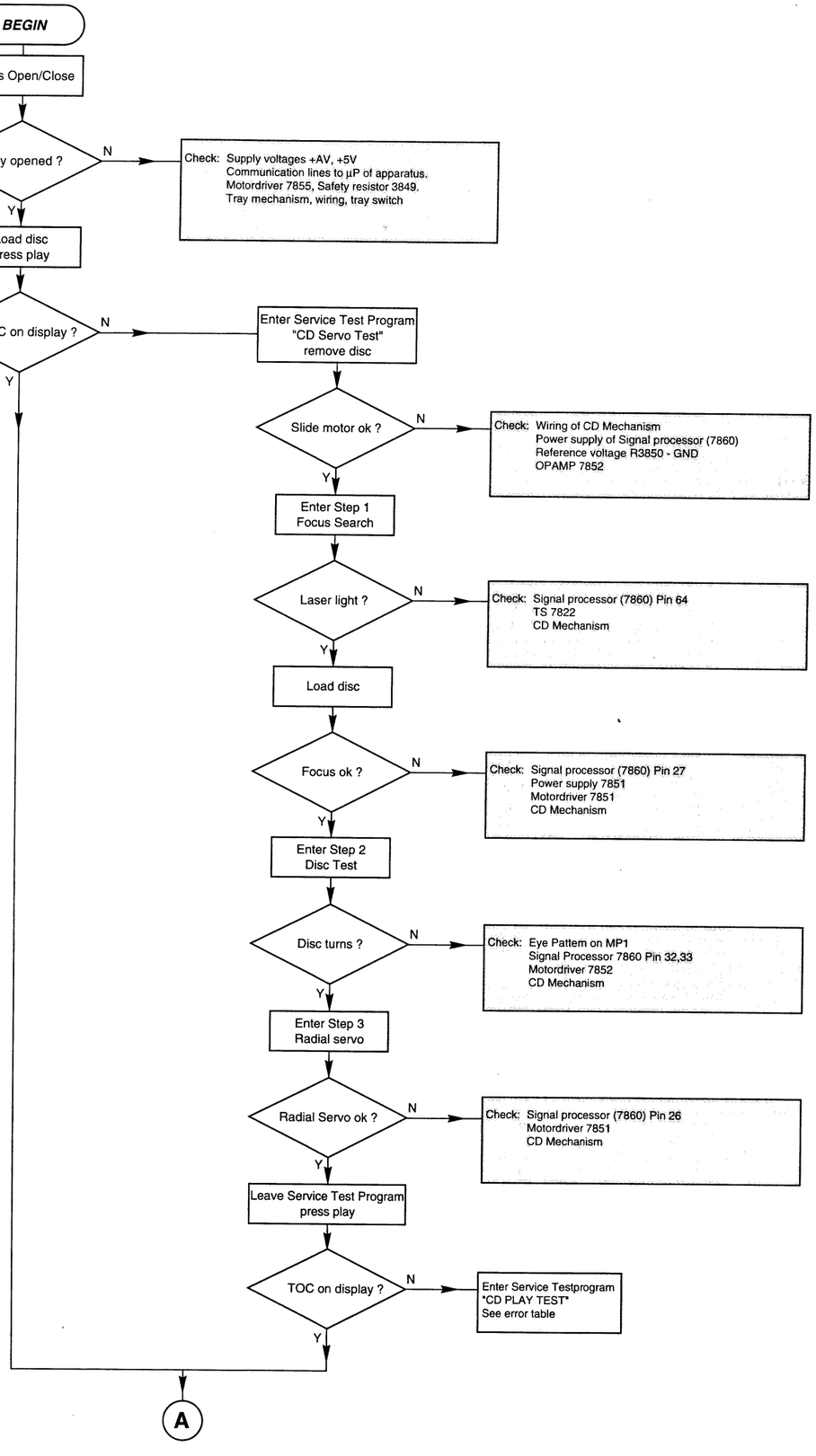
fig.3

## Remarks

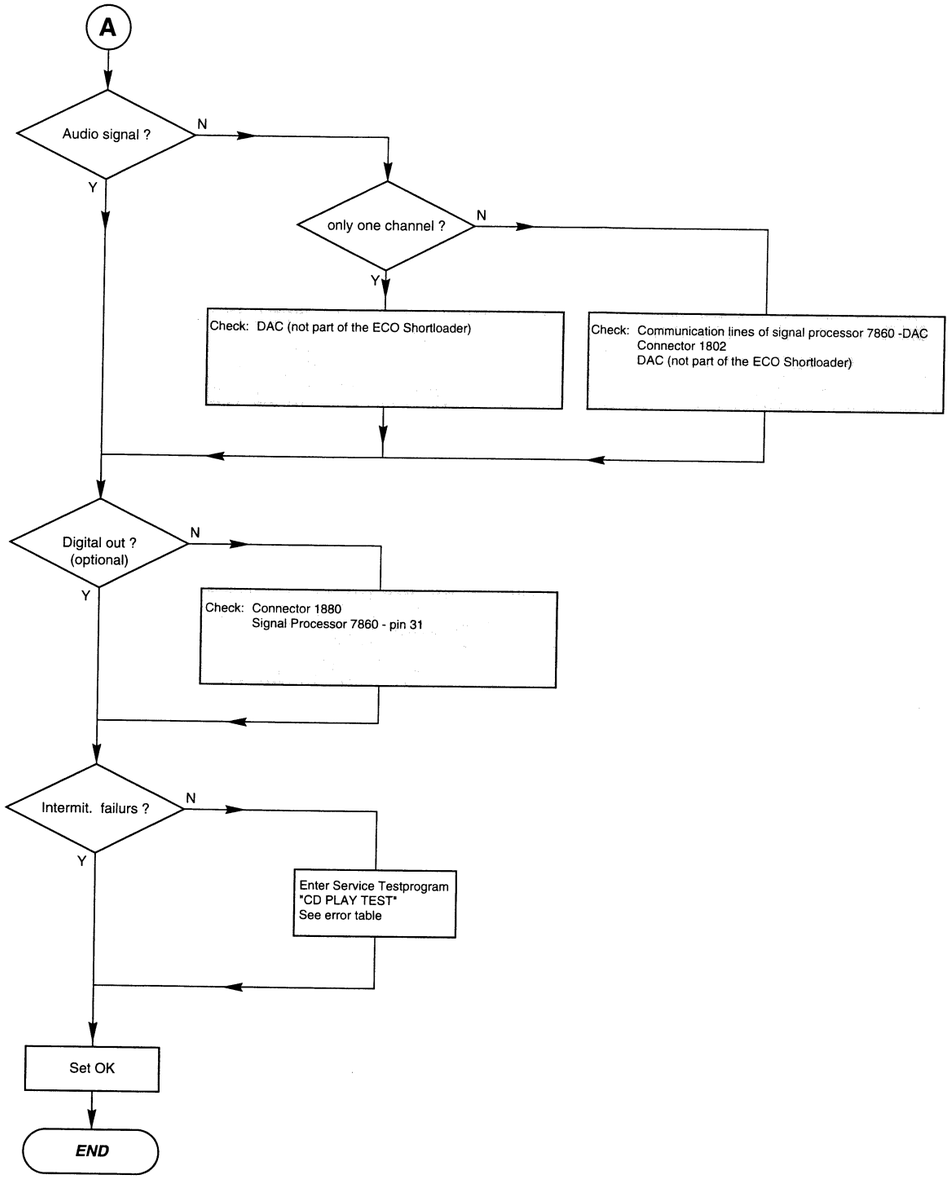







BEGIN
Press Open/Close
Tray opened ?
N
Check: Supply voltages +AV, +5V
Communication lines to µP of apparatus.
Motordriver 7855, Safety resistor 3849.
Tray mechanism, wiring, tray switch
Y
Load disc
press play
TOC on display ?
N
Enter Service Test Program
"CD Servo Test"
remove disc
Y
Slide motor ok ?
N
Check: Wiring of CD Mechanism
Power supply of Signal processor (7860)
Reference voltage R3850 - GND
OPAMP 7852
Y
Enter Step 1
Focus Search
Laser light ?
N
Check: Signal processor (7860) Pin 64
TS 7822
CD Mechanism
Y
Load disc
Focus ok ?
N
Check: Signal processor (7860) Pin 27
Power supply 7851
Motordriver 7851
CD Mechanism
Y
Enter Step 2
Disc Test
Disc turns ?
N
Check: Eye Pattern on MP1
Signal Processor 7860 Pin 32,33
Motordriver 7852
CD Mechanism
Y
Enter Step 3
Radial servo
Radial Servo ok ?
N
Check: Signal processor (7860) Pin 26
Motordriver 7851
CD Mechanism
Y
Leave Service Test Program
press play
TOC on display ?
N
Enter Service Testprogram
*CD PLAY TEST*
See error table
Y
A

7-9

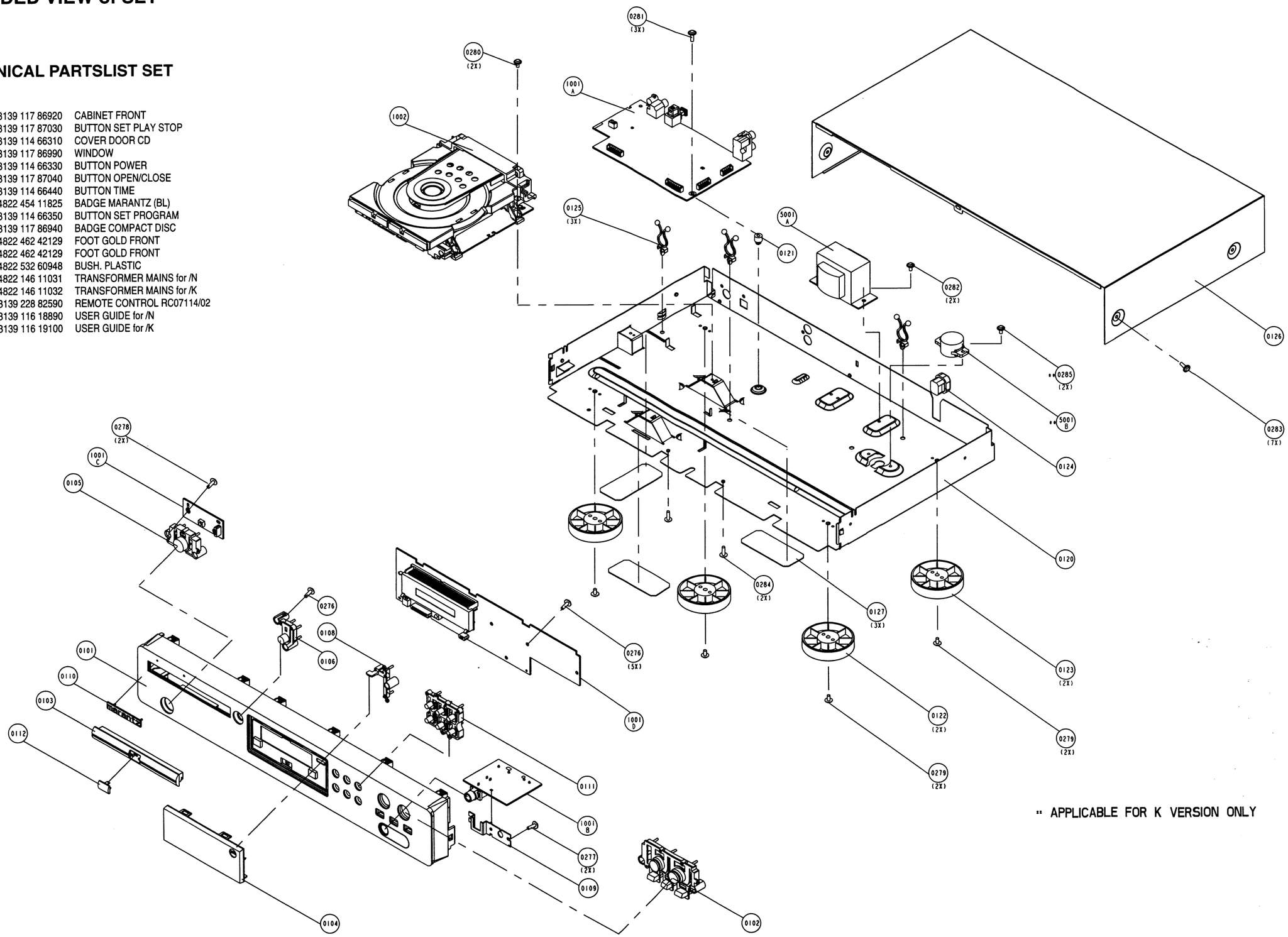

A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC (not part of the ECO Shortloader)
Check: Communication lines of signal processor 7860 -DAC
Connector 1802
DAC (not part of the ECO Shortloader)
Digital out ?
(optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 31
Intermit. failurs ?
N
Y
Enter Service Testprogram
*CD PLAY TEST*
See error table
Set OK
END

10-1

# EXPLODED VIEW of SET

## MECHANICAL PARTSLIST SET

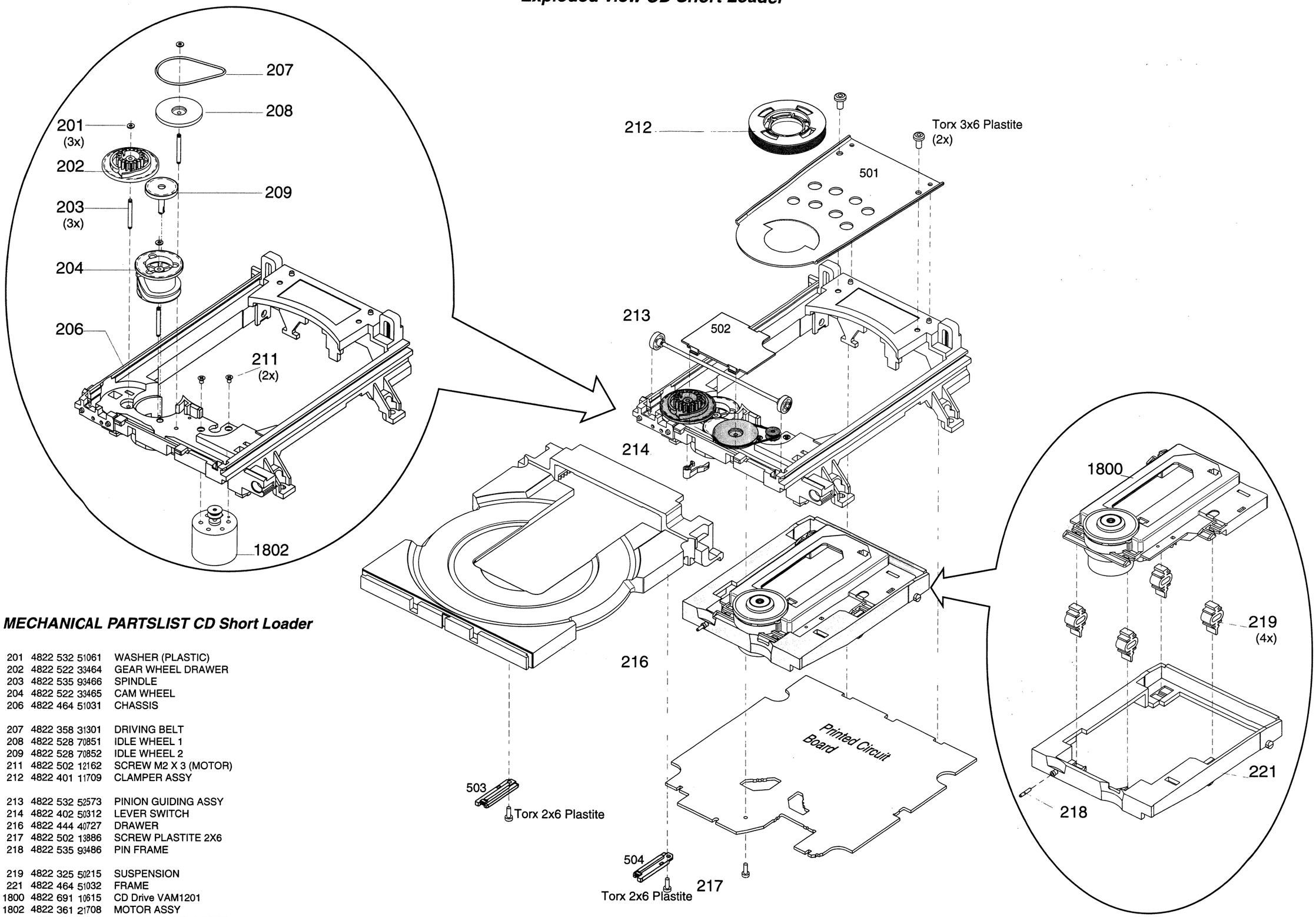
| | | | |
|---|---|---|---|
| 0101 | | 3139 117 86920 | CABINET FRONT |
| 0102 | | 3139 117 87030 | BUTTON SET PLAY STOP |
| 0103 | | 3139 114 66310 | COVER DOOR CD |
| 0104 | | 3139 117 86990 | WINDOW |
| 0105 | | 3139 114 66330 | BUTTON POWER |
| 0106 | | 3139 117 87040 | BUTTON OPEN/CLOSE |
| 0108 | | 3139 114 66440 | BUTTON TIME |
| 0110 | | 4822 454 11825 | BADGE MARANTZ (BL) |
| 0111 | | 3139 114 66350 | BUTTON SET PROGRAM |
| 0112 | | 3139 117 86940 | BADGE COMPACT DISC |
| 0122 | | 4822 462 42129 | FOOT GOLD FRONT |
| 0123 | | 4822 462 42129 | FOOT GOLD FRONT |
| 0124 | | 4822 532 60948 | BUSH. PLASTIC |
| 5001 | ▲ | 4822 146 11031 | TRANSFORMER MAINS for /N |
| 5001 | ▲ | 4822 146 11032 | TRANSFORMER MAINS for /K |
| | | 3139 228 82590 | REMOTE CONTROL RC07114/02 |
| | | 3139 116 18890 | USER GUIDE for /N |
| | | 3139 116 19100 | USER GUIDE for /K |




** APPLICABLE FOR K VERSION ONLY

10-2

## *Exploded view CD Short Loader*




## *MECHANICAL PARTSLIST CD Short Loader*

| | | |
|---|---|---|
| 201 | 4822 532 51061 | WASHER (PLASTIC) |
| 202 | 4822 522 33464 | GEAR WHEEL DRAWER |
| 203 | 4822 535 93466 | SPINDLE |
| 204 | 4822 522 33465 | CAM WHEEL |
| 206 | 4822 464 51031 | CHASSIS |
| | | |
| 207 | 4822 358 31301 | DRIVING BELT |
| 208 | 4822 528 70851 | IDLE WHEEL 1 |
| 209 | 4822 528 70852 | IDLE WHEEL 2 |
| 211 | 4822 502 12162 | SCREW M2 X 3 (MOTOR) |
| 212 | 4822 401 11709 | CLAMPER ASSY |
| | | |
| 213 | 4822 532 52573 | PINION GUIDING ASSY |
| 214 | 4822 402 50312 | LEVER SWITCH |
| 216 | 4822 444 40727 | DRAWER |
| 217 | 4822 502 13886 | SCREW PLASTITE 2X6 |
| 218 | 4822 535 93486 | PIN FRAME |
| | | |
| 219 | 4822 325 50215 | SUSPENSION |
| 221 | 4822 464 51032 | FRAME |
| 1800 | 4822 691 10615 | CD Drive VAM1201 |
| 1802 | 4822 361 21708 | MOTOR ASSY |
| | 4822 502 30735 | SCREW 3 X 6 PLASTITE |

## *ELECTRICAL PARTSLIST CD BOARD*

### MISCELLANEOUS

| | | |
|---|---|---|
| 1800 | 4822 691 10615 | CD DRIVE VAM1201 |
| 1801 | 4822 267 51453 | CON. FLEX FOIL 12 PIN SIDE ENTRY |
| 1810 | 4822 276 13503 | SWITCH |

### CAPACITORS

| | | | | |
|---|---|---|---|---|
| 2761 | 4822 121 51387 | 10nF | 20% | 16V |
| 2764 | 4822 122 33191 | 22pF | 5% | 50V |
| 2765 | 4822 122 33191 | 22pF | 5% | 50V |
| 2766 | 4822 126 12878 | 1,5nF | 10% | 16V |
| 2767 | 4822 122 33191 | 22pF | 5% | 50V |
| 2802 | 4822 126 12882 | 100nF | 20% | 50V |
| 2809 | 4822 126 12785 | 47nF | 10% | 50V |
| 2814 | 4822 126 12339 | 2,2nF | 10% | 16V |
| 2818 | 4822 126 12882 | 100nF | 20% | 50V |
| 2819 | 4822 126 12882 | 100nF | 20% | 50V |
| 2820 | 4822 122 10459 | 560pF | 10% | 50V |
| 2823 | 4822 126 12878 | 1,5nF | 10% | 16V |
| 2825 | 4822 122 10466 | 220pF | 10% | 50V |
| 2826 | 4822 122 10466 | 220pF | 10% | 50V |
| 2827 | 4822 122 10466 | 220pF | 10% | 50V |
| 2828 | 4822 122 10466 | 220pF | 10% | 50V |
| 2829 | 4822 122 10466 | 220pF | 10% | 50V |
| 2830 | 4822 122 10466 | 220pF | 10% | 50V |
| 2831 | 4822 126 12785 | 47nF | 10% | 50V |
| 2836 | 4822 126 13098 | 5,6nF | 20% | 16V |
| 2837 | 4822 122 10459 | 560pF | 10% | 50V |
| 2838 | 4822 126 12882 | 100nF | 20% | 50V |
| 2839 | 4822 121 51387 | 10nF | 20% | 16V |
| 2840 | 4822 122 10576 | 1,8nF | 10% | 16V |
| 2842 | 4822 121 51387 | 10nF | 20% | 16V |
| 2843 | 5322 124 41948 | 0,47µF | 20% | 50V |
| 2844 | 4822 124 22726 | 4,7µF | 20% | 35V |
| 2845 | 4822 122 33848 | 47pF | 5% | 50V |
| 2847 | 4822 124 40433 | 47µF | 20% | 25V |
| 2848 | 4822 121 51387 | 10nF | 20% | 16V |
| 2849 | 4822 124 40433 | 47µF | 20% | 25V |
| 2850 | 4822 124 22726 | 4,7µF | 20% | 35V |
| 2851 | 4822 121 51387 | 10nF | 20% | 16V |
| 2853 | 4822 126 12882 | 100nF | 20% | 50V |
| 2856 | 4822 121 70619 | 22nF | 10% | 50V |
| 2857 | 4822 126 11585 | 22nF | 20% | 50V |
| 2858 | 4822 122 33848 | 47pF | 5% | 50V |
| 2860 | 4822 124 22726 | 4,7µF | 20% | 35V |
| 2861 | 4822 122 33191 | 22pF | 5% | 50V |
| 2862 | 4822 122 33191 | 22pF | 5% | 50V |
| 2863 | 4822 124 81286 | 47µF | 20% | 16V |
| 2869 | 4822 126 12882 | 100nF | 20% | 50V |
| 2870 | 4822 126 12785 | 47nF | 10% | 50V |
| 2890 | 4822 122 33849 | 150pF | 10% | 50V |
| 2898 | 4822 126 12882 | 100nF | 20% | 50V |
| 2899 | 4822 124 22726 | 4,7µF | 20% | 35V |

### RESISTORS

| | | | | |
|---|---|---|---|---|
| 3751 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3752 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3753 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3762 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3763 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3764 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3771 | 4822 116 83883 | 470Ω | 5% | 0,16W |
| 3803 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3804 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3807 | 4822 116 52226 | 560Ω | 5% | 0,5W |
| 3815 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3817 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3818 | 4822 116 52239 | 120kΩ | 5% | 0,5W |
| 3820 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3825 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3826 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3827 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3828 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3829 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3830 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3832 | 4822 116 52191 | 33Ω | 5% | 0,5W |
| 3833 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3835 | 4822 116 52264 | 27kΩ | 5% | 0,5W |
| 3836 | 4822 116 52207 | 1,2kΩ | 5% | 0,5W |
| 3837 | 4822 116 83961 | 6,8kΩ | 5% | 0,16W |
| 3838 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3839 | 4822 116 52207 | 1,2kΩ | 5% | 0,5W |
| 3840 | 4822 116 83961 | 6,8kΩ | 5% | 0,16W |
| 3841 ⚠ | 4822 052 10338 | 3,3Ω | | NFR25 |
| 3842 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3843 | 4822 116 83882 | 39kΩ | 5% | 0,5W |
| 3844 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3845 | 4822 116 83882 | 39kΩ | 5% | 0,5W |
| 3846 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3848 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3849 ⚠ | 4822 052 10338 | 3,3Ω | | NFR25 |
| 3850 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3851 | 4822 116 52264 | 27kΩ | 5% | 0,5W |
| 3852 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3853 | 4822 116 83961 | 6,8kΩ | 5% | 0,16W |
| 3854 | 4822 116 83878 | 270kΩ | 5% | 0,5W |
| 3856 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3857 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3858 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3859 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3860 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3861 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3862 | 4822 116 52235 | 1MΩ | 5% | 0,5W |

## *ELECTRICAL PARTSLIST CD BOARD*

### RESISTORS

| | | | | |
|---|---|---|---|---|
| 3863 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3864 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3865 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3866 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3867 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3868 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3869 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3870 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3871 | 4822 116 52176 | 10Ω | 5% | 0,5W |
| 3872 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3873 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3874 | 4822 116 83864 | 10kΩ | 5% | 0,5W |
| 3875 | 4822 116 52191 | 33Ω | 5% | 0,5W |
| 3876 | 4822 116 52213 | 180Ω | 5% | 0,5W |
| 3879 | 4822 116 52226 | 560Ω | 5% | 0,5W |
| 3881 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3882 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3883 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3890 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3891 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3892 | 4822 116 52271 | 33kΩ | 5% | 0,16W |
| 3893 | 4822 116 52249 | 1,8kΩ | 5% | 0,16W |
| 3895 | 4822 116 52271 | 33kΩ | 5% | 0,16W |
| 3896 | 4822 116 83876 | 270Ω | 5% | 0.16W |
| 3897 | 4822 116 52213 | 180Ω | 5% | 0,5W |

### COILS

| | | |
|---|---|---|
| 5804 | 4822 157 53302 | 1μH |
| 5810 | 4822 157 11517 | 10μH |
| 5860 | 4822 242 10566 | CRYSTAL 8.4672MHz |

### DIODES

| | | |
|---|---|---|
| 6888 | 4822 130 80655 | BZX79-F2V4 |

### TRANSISTORS

| | | |
|---|---|---|
| 7822 | 4822 130 41344 | BC337-40 |
| 7877 | 4822 130 40959 | BC547B |
| 7878 | 4822 130 44503 | BC547C |

### INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7802© | 4822 209 12636 | TDA1302T/N1 |
| 7819© | 5322 209 11517 | PC74HCU04T |
| 7851 | 4822 209 32852 | TDA7073A/N2 |
| 7852 | 4822 209 32852 | TDA7073A/N2 |
| 7855© | 4822 209 31519 | TDA7072A |
| 7860© | 4822 209 12752 | SAA7378GP |

## *ELECTRICAL PARTSLIST HEADPHONE BOARD*

### MISCELLANEOUS

| | | |
|---|---|---|
| 1600 | 4822 267 31453 | HEADPHONE SOCKET 6,3mm |

### CAPACITORS

| | | | | |
|---|---|---|---|---|
| 2603 | 4822 126 11585 | 22nF | 20% | 50V |
| 2604 | 4822 122 33197 | 1nF | 10% | 50V |
| 2605 | 4822 122 33197 | 1nF | 10% | 50V |
| 2610 | 4822 126 12882 | 100nF | 20% | 50V |

### RESISTORS

| | | | | |
|---|---|---|---|---|
| 3603 | 4822 116 52244 | 15kΩ | 5% | 0,5W |
| 3604 | 4822 116 52206 | 120Ω | 5% | 0,5W |
| 3605 | 4822 050 21003 | 10kΩ | 1% | 0,6W |
| 3606 | 4822 050 21003 | 10kΩ | 1% | 0,6W |
| 3607 | 4822 116 52244 | 15kΩ | 5% | 0,5W |
| 3608 | 4822 116 52206 | 120Ω | 5% | 0,5W |
| 3609 ⚠ | 4822 052 10109 | 10Ω | 5% | NFR |
| 3611 ⚠ | 4822 052 10109 | 10Ω | 5% | NFR |

### INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7670 | 4822 209 83274 | NJM4560D |

## *ELECTRICAL PARTSLIST SET*

### MISCELLANEOUS

| | | |
|---|---|---|
| 5001 ⚠ | 4822 146 11031 | TRANSFORMER MAINS for /N |
| 5001 ⚠ | 4822 146 11032 | TRANSFORMER MAINS for /K |
| | 3139 228 82590 | RC07114/02 (Remote Control) |

## *ELECTRICAL PARTSLIST AF BOARD*

### MISCELLANEOUS

| | | | |
|---|---|---|---|
| 1255 ⚠ | 4822 071 56301 | FUSE T 630mA/250V | |
| 1256 ⚠ | 4822 071 56301 | FUSE T 630mA/250V | |
| 1503 | 4822 267 31729 | CINCH SOCKET | |
| 1504 | 4822 265 20553 | CINCH SOCKET | |

### CAPACITORS

| | | | | |
|---|---|---|---|---|
| 2250 | 4822 124 41407 | 0,47µF | 20% | 63V |
| 2251 | 4822 124 11769 | 220µF | 20% | 50V |
| 2252 | 4822 126 11585 | 22nF | 20% | 50V |
| 2253 | 4822 126 11585 | 22nF | 20% | 50V |
| 2254 | 4822 124 11878 | 4700µF | 20% | 16V |
| 2255 | 4822 126 12882 | 100nF | 20% | 50V |
| 2256 | 4822 126 11585 | 22nF | 20% | 50V |
| 2257 | 4822 126 11585 | 22nF | 20% | 50V |
| 2258 | 4822 124 40784 | 3300µF | 20% | 16V |
| 2259 | 4822 124 80144 | 220µF | 20% | 25V |
| 2500 | 4822 126 11585 | 22nF | 20% | 50V |
| 2502 | 4822 124 80144 | 220µF | 20% | 25V |
| 2509 | 4822 122 10466 | 220pF | 10% | 50V |
| 2510 | 4822 122 10466 | 220pF | 10% | 50V |
| 2511 | 4822 124 40433 | 47µF | 20% | 25V |
| 2512 | 4822 124 40433 | 47µF | 20% | 25V |
| 2513 | 4822 122 33519 | 470pF | 10% | 50V |
| 2514 | 4822 122 33519 | 470pF | 10% | 50V |
| 2521 | 4822 124 22263 | 220µF | 20% | 25V |
| 2522 | 4822 124 22263 | 220µF | 20% | 25V |
| 2523 | 4822 121 51387 | 10nF | 20% | 16V |
| 2524 | 4822 124 40433 | 47µF | 20% | 25V |
| 2529 | 4822 122 33197 | 1nF | 10% | 50V |
| 2530 | 4822 122 33197 | 1nF | 10% | 50V |
| 2531 | 4822 126 11585 | 22nF | 20% | 50V |
| 2541 | 4822 124 21913 | 1µF | 20% | 63V |
| 2543 | 4822 126 12882 | 100nF | 20% | 50V |

### RESISTORS

| | | | | |
|---|---|---|---|---|
| 3251 ⚠ | 4822 053 10471 | 470Ω | 5% | 1W |
| 3252 ⚠ | 4822 053 10471 | 470Ω | 5% | 1W |
| 3253 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3254 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3255 | 4822 116 52256 | 2,2kΩ | 5% | 0,16W |
| 3256 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3257 ⚠ | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3258 | 4822 116 52283 | 4,7kΩ | 5% | 0,5W |
| 3259 | 4822 052 10478 | 4,7Ω | 5% | NFR |
| 3260 ⚠ | 4822 052 10568 | 5,6Ω | 5% | 0,33W |
| 3500 | 4822 116 52289 | 5,6kΩ | 5% | 0,16W |
| 3501 | 4822 050 21003 | 10kΩ | 1% | 0,6W |
| 3502 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3503 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3504 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3505 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3506 | 4822 116 52244 | 15kΩ | 5% | 0,5W |
| 3507 | 4822 050 21003 | 10kΩ | 1% | 0,6W |
| 3511 | 4822 116 52269 | 3,3kΩ | 5% | 0,5W |
| 3512 | 4822 116 52269 | 3,3kΩ | 5% | 0,5W |

### RESISTORS

| | | | | |
|---|---|---|---|---|
| 3513 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3514 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3527 | 4822 116 52256 | 2,2kΩ | 5% | 0,16W |
| 3532 | 4822 116 83874 | 220kΩ | 5% | 0,5W |
| 3534 | 4822 050 21003 | 10kΩ | 1% | 0,6W |
| 3535 | 4822 116 52289 | 5,6kΩ | 5% | 0,16W |
| 3537 | 4822 116 83872 | 220Ω | 5% | 0,5W |
| 3538 | 4822 116 52207 | 1,2kΩ | 5% | 0,5W |
| 3539 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3540 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3541 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3542 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3543 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3544 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3545 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3547 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3548 | 4822 116 52256 | 2,2kΩ | 5% | 0,16W |
| 3556 | 4822 116 52176 | 10Ω | 5% | 0,5W |
| 3557 ⚠ | 4822 052 10688 | 6,8Ω | 5% | 0,33W |

### COILS

| | | |
|---|---|---|
| 5801 | 4822 156 31058 | 100µH |

### DIODES

| | | |
|---|---|---|
| 6250 | 4822 130 34379 | BZX79-C27 |
| 6251 | 4822 130 34174 | BZX79-B4V7 |
| 6252 | 4822 130 31878 | 1N4003G |
| 6253 | 4822 130 31878 | 1N4003G |
| 6254 | 4822 130 31878 | 1N4003G |
| 6255 | 4822 130 31878 | 1N4003G |
| 6256 | 4822 130 31878 | 1N4003G |
| 6257 | 4822 130 31878 | 1N4003G |
| 6258 | 4822 130 31878 | 1N4003G |
| 6259 | 4822 130 31981 | BZX79-C3V9 |
| 6260 | 4822 130 31878 | 1N4003G |
| 6500 | 4822 130 30621 | 1N4148 |

### TRANSISTORS

| | | |
|---|---|---|
| 7250 | 4822 130 41327 | BC327-40 |
| 7252 | 5322 130 60068 | BC558C |
| 7500 | 4822 130 41327 | BC327-40 |
| 7501 | 5322 130 60068 | BC558C |
| 7504 | 4822 130 44568 | BC557B |
| 7507 | 4822 130 41344 | BC337-40 |
| 7508 | 4822 130 41344 | BC337-40 |
| 7509 | 4822 130 41344 | BC337-40 |
| 7510 | 4822 130 41344 | BC337-40 |

### INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7251 ⚠ | 4822 209 80817 | L7805CV |
| 7502 | 4822 209 31147 | TDA1545A/N2 DAC |
| 7505 | 4822 209 83274 | NJM4560D |

## *ELECTRICAL PARTSLIST FRONT BOARD*

### MISCELLANEOUS

| | | |
|---|---|---|
| 1800 | 3139 110 51970 | DISPLAY |
| 1820 | 4822 276 13114 | TACT SWITCH |
| 1821 | 4822 276 13114 | TACT SWITCH |
| 1822 | 4822 276 13114 | TACT SWITCH |
| 1823 | 4822 276 13114 | TACT SWITCH |
| 1824 | 4822 276 13114 | TACT SWITCH |
| 1825 | 4822 276 13114 | TACT SWITCH |
| 1826 | 4822 276 13114 | TACT SWITCH |
| 1827 | 4822 276 13114 | TACT SWITCH |
| 1828 | 4822 276 13114 | TACT SWITCH |
| 1829 | 4822 276 13114 | TACT SWITCH |
| 1830 | 4822 276 13114 | TACT SWITCH |
| 1831 | 4822 276 13114 | TACT SWITCH |
| 1832 | 4822 276 13114 | TACT SWITCH |
| 1840 | 4822 276 13114 | TACT SWITCH |
| 7810 | 4822 130 10165 | GP1U28XP, IR EYE |

### CAPACITORS

| | | | | |
|---|---|---|---|---|
| 2800 | 4822 124 22726 | 4,7µF | 20% | 35V |
| 2801 | 4822 124 22726 | 4,7µF | 20% | 35V |
| 2803 | 4822 126 11585 | 22nF | 20% | 25V |
| 2807 | 4822 124 40207 | 100µF | 20% | 25V |
| 2808 | 4822 126 11585 | 22nF | 20% | 50V |
| 2810 | 4822 121 51387 | 10nF | 20% | 16V |
| 2811 | 4822 121 51387 | 10nF | 20% | 16V |
| 2812 | 4822 126 12882 | 100nF | 20% | 50V |
| 2813 | 4822 126 12882 | 100nF | 20% | 50V |
| 2814 | 4822 124 40433 | 47µF | 20% | 25V |
| 2815 | 4822 121 42408 | 220nF | 5% | 63V |

### RESISTORS

| | | | | |
|---|---|---|---|---|
| 3807 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3808 | 4822 116 52195 | 47Ω | 5% | 0,5W |
| 3809 | 4822 116 52234 | 100kΩ | 5% | 0,5W |
| 3810 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3811 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3812 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3813 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3814 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3815 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3816 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3817 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3818 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3819 | 4822 116 52257 | 22kΩ | 5% | |
| 3820 | 4822 116 52182 | 15Ω | 5% | 0,5W |
| 3821 | 4822 116 52182 | 15Ω | 5% | 0,5W |
| 3822 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3823 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3829 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3830 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3832 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3833 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3834 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3835 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3836 | 4822 116 52257 | 22kΩ | 5% | 0,5W |
| 3837 | 4822 116 83884 | 47kΩ | 5% | 0,16W |
| 3838 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3841 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3842 | 4822 050 11002 | 1kΩ | 5% | 0,2W |

### RESISTORS

| | | | | |
|---|---|---|---|---|
| 3844 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3845 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3846 | 4822 050 11002 | 1kΩ | 5% | 0,2W |
| 3847 | 4822 116 52175 | 100Ω | 5% | 0,5W |
| 3848 | 4822 116 52182 | 15Ω | 5% | 0,5W |
| 3849 | 4822 116 52182 | 15Ω | 5% | 0,5W |

### COILS

| | | |
|---|---|---|
| 1833 | 4822 242 72066 | CERAMIC FILTER 8,0MHz |
| 5802 | 4822 156 21721 | 2,2µH |

### DIODES

| | | |
|---|---|---|
| 6800 | 4822 130 30621 | 1N4148 |
| 6801 | 4822 130 30621 | 1N4148 |
| 6804 | 4822 130 30621 | 1N4148 |
| 6805 | 4822 130 30621 | 1N4148 |
| 6806 | 4822 130 30621 | 1N4148 |
| 6807 | 4822 130 30621 | 1N4148 |
| 6808 | 4822 130 30621 | 1N4148 |
| 6809 | 4822 130 30621 | 1N4148 |
| 6811 | 4822 130 30621 | 1N4148 |
| 6812 | 4822 130 30621 | 1N4148 |
| 6813 | 4822 130 30621 | 1N4148 |
| 6814 | 4822 130 30621 | 1N4148 |
| 6820 | 4822 130 31878 | 1N4003G |

### TRANSISTORS

| | | |
|---|---|---|
| 7811 | 4822 130 40959 | BC547B |

### INTEGRATED CIRCUITS

| | | |
|---|---|---|
| 7800© | 4822 209 16738 | TMP87CM71-83770 MICROPROCESSOR |